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ABSTRACT

This is one of several papers written to provide a rationale for programs of the new National Institute of Education (NIE). The basic elements of the rationale for each proposed NIE program and the sequence in which they will be discussed are: (1) educational goals to be achieved, (2) variables that can be manipulated to reach the goals, (3) current practice and status of R&D on the variables, (4) new R&D programs that might lead to goal achievement, and (5) management and budget recommendations. The research and development programs derived from this rationale fall into four areas defined by NIE legislation: (1) basic research to increase the fund of knowledge about education, (2) improvement of current educational practice, (3) activities to build the R&D capability of the country, (4) programs to solve major educational problems. The selection of Learner Goals, Enabling Goals, and Systems Goals is based upon the opinions and work of many people and a wide range of literature sources. Learner goals have three areas: social-emotional development, cognitive development, and physical development. Enabling goals include effective selection and training of persons who work in education and effective dissemination of R&D results. System goals include productivity, access, and participation. (CK)

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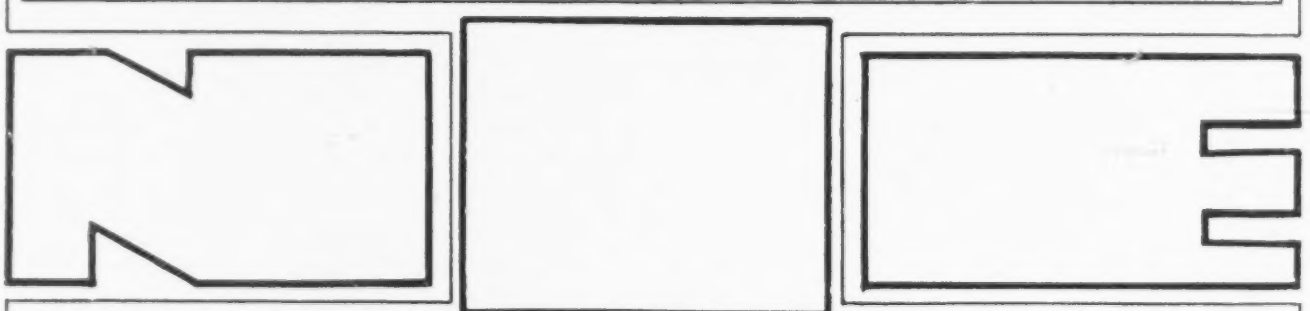

National Institute of Education

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Report No. P103

A RESEARCH AND DEVELOPMENT AGENDA FOR THE NATIONAL INSTITUTE OF EDUCATION

July, 1972

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I. OVERVIEW OF THE ANALYSIS

This is one of several papers written to provide a rationale for programs of the new National Institute of Education. During the one year existence of the NIE Planning Unit, the staff has met with several hundred people and made more than a dozen contracts to obtain analyses and detailed descriptions for suggested R&D programs. Tables 1 and 2 list a series of two-day meetings that were held with various disciplinary and special interest groups and a series of contracts that led to program planning documents.

The basic elements of the rationale for each proposed NIE program and the sequence in which they will be discussed are:

1. Educational goals to be achieved;
2. Variables that can be manipulated to reach the goals;
3. Current practice and status of R&D on the variables;
4. New R&D programs that might lead to goal achievement;
5. Management and budget recommendations.

The research and development programs derived from this rationale fall into four areas defined by NIE legislation: basic research to increase our fund of knowledge about education; improvement of current educational practice; activities to build the R&D capability of the country; and programs to solve major educational problems.

Because NIE will inherit many worthwhile ongoing R&D programs from the Office of Education, they are incorporated in this paper's goal analysis and resulting agenda. These continuing programs represent almost $100 million of NIE's $125 million fiscal 1973 budget.

Figure 1 and Table 3 summarize the analysis presented in this paper. They list the goals, the old and new programs designed to achieve them, their organizational location within an interim NIE structure, and an estimated budget allocation for fiscal 1972 and fiscal 1973.

The selection of Learner Goals, Enabling Goals, and Systems Goals is based upon the opinions and work of many people and a wide range of literature sources.

Learner goals were divided into three areas: (1) Social-emotional development, which includes learning to sustain onself socially and emotionally through self-acceptance, successful social interaction, acceptance of responsibility, and adaptation to new situations; (2) Cognitive development, reached through acquisition of basic academic skills and the ability to use those skills to further one's own education; and (3) Physical development, which includes selecting a nutritious diet, avoiding hazards, attending to symptoms of illness, and getting proper exercise;

Implicit in the discussion of each learner goal and its related programs is the notion that people learn through doing: i.e., it is necessary to provide conditions which encourage students to engage in the desired goal behavior directly rather than talk about it or experience it vicariously.

Enabling goals include (1) Effective selection and training of persons who work in education, both in traditional roles and in roles defined by NIE's new R&D programs; and (2) Effective dissemination of R&D results through informing the field about new knowledge and programs, demonstrating improvements in practice, and building demand for (and ways to implement) alternatives that are significantly different from the current educational system. Enabling goals are those which, for the most part, support the R&D system and are only indirectly instrumental in improving the educational system.

System goals like learner goals, have three areas: (1) Productivity, which includes the use of information and technology to make educational activities effective and efficient; (2) Access, which involves the equitable provision of educational services to all groups who need them; and (3) Participation, which is intended to provide ways for citizens to understand, obtain, and sometimes provide for themselves, the educational services they want and need. Although learner goals can possibly be achieved without the system goals, the educational system would probably not be acceptable without them.

Table 1

Disciplinary and Special Interest Meetings

Topics	Chairmen
Psychology	George Miller (Princeton University)
Sociology	Burton Clark (Yale University)
Educational Technology	John Truxal (Polytechnical Institute of Brooklyn)
Anthropology	John Whiting (Harvard University)
Classroom Craftsmen	William McConnell (Webster College)
Representative of the National Education Association	William Morrison (President NEA)
Curriculum Research and Development	Wade Robinson (Central Midwestern Regional Educational Laboratory)
Educational Publishers	Robert Follett (Follett Publishing Co.)
Deans of Schools of Education	Ted Cyphert (University of Virginia)
Reading	Harry Levin (Cornell University)
Measurement and Evaluation	Samuel Messick (Educational Testing Service)

Table 2

Contracts

Report: *Community Participation in Education*
Author: Polly Greenberg

Report: *A Culturally-Based Education System for the Disadvantaged*
Author: Joan C. Baratz

Report: *Open-Informal Education: Recommendations for Research and Development*
Author: Lillian G. Katz

Report: *A Program Development Document to Improve the Quality of Education for the Disadvantaged*
Authors: A Group at the University of Illinois, headed by Prof. Frederick A. Rodgers

Report: *Program Proposals for Improving the Quality of Educational Experiences*
Authors: A Group Drawn from Several Universities, headed by Prof. Robert Davis of Syracuse University

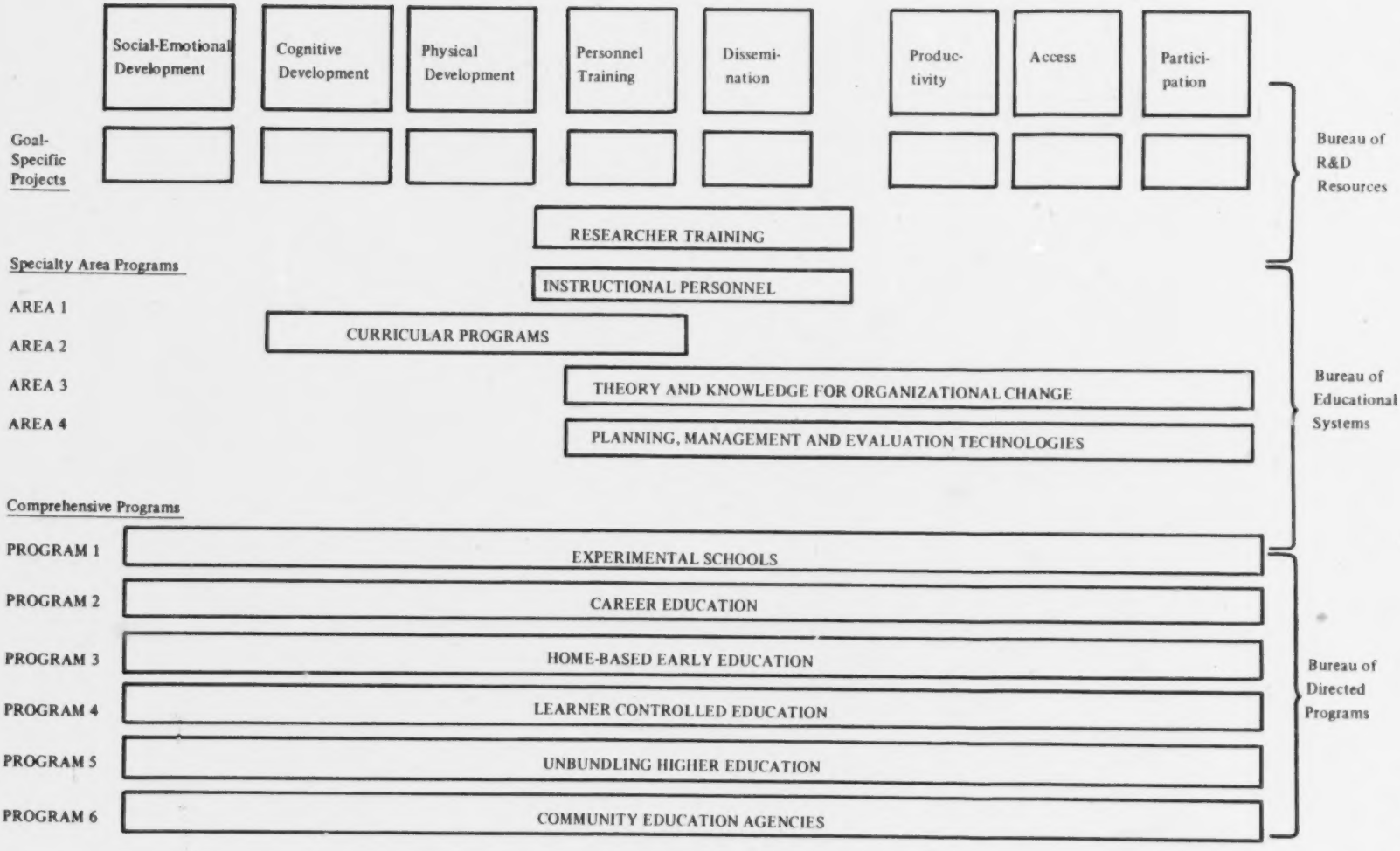
Report: *Research Priorities for R&D Projects in the Economics of Education*
Authors: A Group at the University of California (Berkeley), headed by Prof. Charles S. Benson

Report: *The Problem of Obtaining and Using Resources in Education. Some Proposed Programs for Purposive Change*
Authors: A Group at the University of Colorado, headed by Profs. Larry D. Singell, Nicholas W. Schrock, and Wesley T. Jordan

Report: *Educational Outcomes, Processes, and Decisions: Frontiers of Economic Research and Development for the 1970's*
Authors: A Group Drawn from Several Universities, headed by Prof. Mary Jean Bowman of the University of Chicago

Report: *Alternative Strategies and Program Initiatives for NIE*
Authors: O. W. Markley, Dorothy Mckinney, and Dan L. Rink of the Stanford Research Institute

Report: *An N.I.E. Strategy Paper*
Author: Amitai Etzioni



SCHEME FOR GOALS AND ACTIVITIES

Figure 1

Table 3

BUDGETS BY NIE OFFICE

(in millions)

	Fiscal 1972	Fiscal 1973
Bureau of R&D Resources (Total)	$ 15.0	$ 20.5
Extramural Projects	12.0	12.0
Research Training	3.0	5.0
Developing Institutions		2.0
Intramural Research*		(3.0)
Program Management		1.5
Bureau of Educational Systems (Total)	39.0	54.0
Specialty Areas:		
1. Instructional Personnel	3.0	2.0
2. Curricular Programs	10.0	9.0
3. Organizational Change	3.0	3.0
4. Planning, Management, and Evaluation	8.0	7.0
Comprehensive Programs		
Experimental Schools	15.0	30.0
Intramural Research*		(1.0)
Program Management		2.5
Bureau of Directed Programs (Total)	30.0	45.5
Comprehensive Programs		
Career Education	20.5	25.0
Home-Based Early Education	5.0	5.5
Learner-Controlled Education	4.5	7.0
Unbundling Higher Education		2.5
Community Education Agencies		2.5
Intramural Research*		(3.5)
Program Management		3.5
TOTAL	84.0	120.0

* Allowable funds for intramural research for each office; included as part of program funds.

Several classes of variables can be manipulated to achieve these educational goals: substance of the educational experience; selection of target audience; personnel selection; the educational setting; time and space distribution; allocation of monetary resources and incentives; changes in societal sanctions, laws, and rules; and changes in organizational structure and information flow. The characteristics of each goal and how well it is now being achieved suggest which combinations of variables are most likely to bring about the solution. Consider two examples that will be discussed in more detail later:

First, most social development happens before the child reaches school or after he graduates, and is influenced by a wider variety of people than school teachers. The investment of current R&D resources on social development is disproportionately low in relation to its importance. Most educational research on social development has occurred in the artificial training environment of schools. Funds for R&D on social development should probably be increased and placed where such development actually occurs–in the home, community, and at work.

Second, education has invested in technology in the form of films, projectors, recorders, and the like. However, these have been disjointed "add-ons" to the current teacher-led instruction and have not increased educational productivity. As an alternative, the basic organization of instruction could be changed to focus on the student as the productive element rather than the teacher. Technology could then be used to allow the individual student access to different educational experiences, perhaps resulting in better use of student time and educational dollars.

Although these examples suggest operating programs that would interrelate many educational goals and contributing variables, each of the goal areas must be conceptualized separately to derive such program proposals. A detailed discussion of goals and how they lead to program suggestions is presented in this document following the overview.

In Figure 1, the horizontal bars represent both old and new programs and program areas; the vertical columns indicate the goals covered by each program. Some current programs such as Experimental Schools and Career Education involve all the goals, but most current activities seem to fall into goal specific projects, or to cut across either learner goals or system goals. In order to be called a comprehensive program, they must encompass the enabling goals, in addition to learner and system goals.

The small empty boxes in the first row below the goal titles represent basic research projects that are related to one goal or another. This research will be primarily an extramural unsolicited program. While the research will not be directed, it may be classified by goal area so that a staff with the right balance of expertise can be acquired by NIE to help coordinate the projects and serve as resource people on problem solving activities of the agency. When specific research activities are needed to complement large development projects or fill the information needs of the agency, an intramural project will be initiated. This will avoid having extramural funds tapped for directed projects in basic research.

The program for researcher training represented by the short bar is the familiar area that now exists in the National Center for Educational Research and Development (NCERD), though it will have some added features in NIE. For example, a small grant program is suggested with payment not only for students and novice researchers, but also for experimental researchers in the field who interact with the grantee and to whom the students may serve as apprentices.

Another recommendation is that large R&D efforts have some on-the-job training (OJT) positions attached to them, on the assumption that if a group is good enough to receive several million dollars in program money, a novice could gain valuable experience by working with them. A plan for how OJT might be provided in the project would be a required part of the new proposals.

Moving down the diagram, the specialty area programs are, for the most part, those Regional Lab and R&D Center programs that have been grouped together for the 1972 spring evaluation. The evaluation is being conducted at NCERD and is designed to give budget guidance to NIE management. Each specialty area is a loosely related cluster of programs placed under the goals they seem most concerned with. Two other clusters in the spring evaluation relate to early childhood education and career education, and will fall within other programs and projects on the agenda.

Finally, the comprehensive programs that cut across goals are shown at the bottom of the chart. The first two programs originated in the Office of Education and are probably already familiar to the reader. The last four are being suggested by this analysis as new

programs. Deriving the programs from a goal analysis has been complicated and will be discussed later. However, in this overview, the "flavor" of each of the new programs can be suggested in just a sentence or two.

Program 3, the Home-Based Early Education program, is based on recent evidence that indicates the greatest R&D payoff may come from developing ways to help mothers help their own children. It will probably contain at least three elements: first, a component to provide places where expectant and new mothers can come for help and child care instruction; second, a component to develop milestone measures of social and physical development and simple procedures to apply them; and third, a component to develop in-home day-care programs employing neighborhood mother-substitutes to care for preschool neighborhood children and counsel other mothers in the care of their children.

Program 4, Learner-Controlled Education, stems from an analysis of the open schools movement and will involve design, development, and tryout of several models that seem likely to help students use basic academic and problem-solving skills to direct and continue their own education. It will be technologically oriented, with concern for objectives the student must accomplish, ways to provide individual access to educational alternatives, and ways to build the learner's control of his own motivation.

Program 5, Unbundling Higher Education, means what one might expect from the original use of "unbundling" in the computer industry. This program would identify several functions of higher education that are now "bundled" together and only obtainable as a single package, like information transfer, credentialing, socialization, exposure to work models, etc. An unbundling program will experiment with providing options for students to obtain particular functions from different agencies rather than having to accept the complete college package from an institution of higher learning.

Program 6, the Community Education Agency, is intended to develop new mechanisms for the community to govern and participate in providing its own educational services. For example, the agency might develop a mechanism for community residents to provide a variety of neighborhood services, such as tutoring children who have difficulty in basic subjects or directing cross-age recreation and aesthetic programs. The agency could also allow for community-improvement projects that give students realistic educational encounters with the community's social power systems.

Suggested NIE organizational placements are listed along the right side of Figure 1. Program placement was based upon whether the program was primarily designed to: 1) solve major educational problems through directed and programmatic mission-oriented R&D; 2) improve practices within the current educational system; or 3) add to our knowledge, resources, and understanding of the foundations of the educational process. These functions seem to imply differences in planning and management style best accommodated by different bureaus. Needless to say, staff members will be strongly encouraged to work in more than one Bureau and it is expected there will be some rotation of people among bureaus.

As the purpose of most new comprehensive programs is to solve major problems, they are placed in the Programs Bureau. Efforts here will involve careful problem analysis, internal planning, and large scale development activities. As a result, the management of this office will be quite directive and will require a higher ratio of management personnel to program funds than other bureaus.

Most activities continuing from the Office of Education have been devoted to improving practice within the current educational system, and were therefore placed in an Educational Systems Bureau. Typical examples are the Experimental Schools Program, and many of the Regional Laboratory and R&D Center programs. These programs usually involve finding the best educational components of existing programs, making modest improvements, combining and trying out components, and communicating the improvements to practitioners. These efforts require less directive planning and management, more investment in R&D proposals from the field, and more practitioner involvement. They require specification of R&D parameters, but program planning and management requirements can largely be met externally. The ratio of agency personnel to program funds is less than that in directed programs, but more than that of basic research.

Basic research and researcher training involve smaller research projects than those in problem solving

and practice improvement. More precise methodology, more specialized talent and more freedom for the expert researcher in the field are needed. NIE must attend only to the balance of topics, quality of proposals, completion of efforts, and dissemination of results. Because of these characteristics, Basic Research and Researcher Training were placed within an Educational Resources or Foundations Bureau having a management style that involves the least agency direction and the smallest ratio of internal personnel to program funds.

The fiscal 1972 programs within OE have been classified for transfer to the new operating program bureaus within NIE. Their budgets are summarized by bureau in Table 3, with estimates included for funds that have not yet been spent. The suggested budgets for fiscal 1973 are also included. A listing of specific ongoing projects in each organizational unit is available. An additional $5 million of the budget provides for administrative services to make a total 1973 NIE budget of $125 million.

II. GOAL ANALYSIS

A. Learner Goals

1. Social and Emotional Development

For satisfactory personal development, the individual must sustain himself socially and emotionally. The aspects of social and emotional development that are considered here are: a) self-acceptance; b) relating to others; c) learning to take responsibility; and d) adapting to new situations. Social and emotional development begin early, as soon as the child needs attention from others for food and comfort. Later the young child must learn to make and keep friends and to persist in tasks. As he grows older he must learn to do his share in team situations, to make new emotional and family ties, to support himself financially, and to meet society's regulations. Thus, the need to learn new social skills and to sustain oneself emotionally extends even into old age. Though social and emotional development cannot be divorced from any part of a person's existence, it is probably more influenced by the home and community than by school experiences.

The most critical developmental tasks appear at the beginning of life and at times when the individual faces major physical and social changes–such as early childhood, the late teen years, and in late adult life. Yet, in only one of these critical periods are citizens guaranteed the right to education: the late teenage period. Even then, educational programs are tied to the schools and do not provide for social learning in the more natural settings of home, community, and job. The greatest payoff for education in this goal area is probably in the early childhood years when basic personality patterns are set and little educational effort is undertaken there. With an increasing life span and an accelerating rate of change in society, the social and emotional needs of older people should also be of much more concern. NIE should probably concentrate on programs for social and emotional development of pre-school children and adults.

Though there is a massive literature on social and emotional development, the area is not well defined and measures are not adequate. NIE should devote some attention to developing measures of social and emotional growth. Despite the paucity of useful measures, there is growing agreement on some factors that contribute to these kinds of development.

For example, developing attachments to others seems to be the infant's most critical social development task. Findings of the Harvard Preschool Project indicate that differences in children's ability to get attention and help from adults (one index of attachment) and to interact on a verbal level appear as early as 18 months. These differences seem related to the mother's being available and giving a few moments of help when needed as well as how much she encourages the child to initiate activities.

a. Self-acceptance. Children seek confirmation of their existence and value from the people around them. The development of self-confidence probably depends upon the availability of supportive persons, not only in early childhood, but whenever critical changes occur in one's life. Entering school is one such critical change. Children typically

begin school at the same age and stay in school for the same amount of time each day, regardless of their readiness for the separation from home. Movement to the institution can be very abrupt, and when the child's home and school cultures diverge, he risks rejection (whether real or perceived). Children who are loud or rough, respond more to physical cues than verbal cues, dress and wash carelessly, withdraw from adults, etc., are generally different from most of their middle class teachers. The teacher, not recognizing these behaviors as strengths the child may need in a rough neighborhood–survival techniques, as it were–often rejects the child. She speaks more often to children who are polite, shows discomfort at physical contact with poor children, rarely visits their homes, and sets lower academic and social expectations for them. At the very time when the child is in need of supportive persons to learn new social and emotional responses in a new setting, these people are lacking, and his self-acceptance may suffer. A vicious cycle then results when low self-acceptance contributes to low achievement, which in turn lowers self-acceptance even further.

b. Relating to others. Middle childhood's main task of establishing peer relationships depends upon learning skills like sharing, settling arguments, taking turns, letting others lead, being sympathetic, etc. The child probably learns these skills best from accepting adults who practice these behaviors. In addition, the child must have opportunities to practice these behaviors in settings like those he will meet later in life. It is difficult for schools to give more than incidental attention to these skills because a great deal of school work is individual work and is done alone; in doing it, relationships with others must be suppressed. Classroom routines require much waiting time on the part of children–usually with enforced silence. It might be much more helpful to shorten the school day and use this waiting time to expose children to people from their own neighborhoods in situations where social interaction is the central focus of activity.

c. Responsibility. Such behaviors as finishing tasks one has promised to do, or being punctual, are related to a desire to achieve and a sense of responsibility. They are the mixture of compliance and independence that contributes to adult success. Opportunities for most children to meet situations that require dependability, and to see others assume responsibility, usually occur only in a haphazard manner. The school, with its almost constant placement of the teacher in a superior role to the student, may build compliance, but may also hinder independence. A sensible formula for building responsibility and achievement, but one that is not systematically followed, is to give children ample opportunity to assume responsibility in situations at which they can succeed. There are many tasks that children could do and be rewarded for around schools, nursery schools, libraries, hospitals, and churches, around stores, barbershops, offices, and other small businesses. Success in these tasks would foster a sense of achievement and responsibility, but almost no widescale programs of this type exist at present.

d. Adaptability. Part of personal development is learning to adapt to new situations. People must make new family ties, adapt to societal problems such as crowding and mobility, meet cyclical changes in life like moving from marriage to widowhood, work to retirement, or changing careers. A number of accepted psychological principles support the practice of having the student perform in a wide variety of realistic settings as effective training for adaptability. For example:

> Learners are more likely to try things they have practiced than those they have only talked about.
>
> Practicing in a variety of situations promotes greater generalization to new settings.
>
> Helping a learner meet new situations successfully and gradually withdrawing that help as he becomes more competent leads to independent and creative action in other new situations.
>
> Observing others as they take actions that seem to work often leads to imitating those actions in a similar situation.

Schools provide only a narrow range of situations in which these principles can be applied to learning social adaptiveness. Community resources could be, but are seldom systematically tapped to provide young people with a wide variety of work experiences, community service opportunities, demands to interpret and follow rules, etc. Teachers are usually transmitters of knowledge rather than working artists, laborers, or professionals who serve as models. As a result, adults frequently graduate from school, only to realize that

they had been "marking time" in a situation that was narrow and unrealistic and that academic skills were unrelated to life outside of school.

Even the brief discussion above suggests a number of programs that NIE might undertake, as well as some that probably should not be pursued. For example, extensive work on social and emotional development in the school context probably wouldn't be profitable. The school day, in fact, should probably be shortened so that different settings and people could be used to teach social skills. Some positive suggestions for activities that might be developed are:

1) Increase the likelihood that infants and preschool children receive consistent and continuous supportive care by providing fundamental instruction for key neighborhood parents, especially in the day-care setting. In this same context, or in connection with regular health checkups, establish the role of advisor-evaluator of young children's emotional and social growth.

2) Develop a program to use measures of social and emotional growth to prescribe: entry into formal schooling, lengths of school days for individuals, and kinds of classroom experiences. The goal of this program would be continued social and cognitive growth. The very socially immature child might benefit more from extra time spent practicing actual responsibility out of the classroom rather than extra time spent in it. Shortened academic programs would relate closely to neighborhood programs that concentrate on helping youngsters to take responsibility for every task they can handle, like helping in libraries and lunchrooms and tutoring other youngsters.

3) Develop a program to shorten the years of compulsory education for youngsters, but provide entitlement to education services for a specified number of years usable at any time of life. In order to manage provision of services, community agencies could help people of all ages get education for new jobs, health, hobbies, home upkeep, etc. These agencies would also serve as the management depot that helps to get students into the community for more realistic learning experiences.

Each of these suggestions will be developed in greater detail as part of one or more comprehensive programs suggested for NIE. However, there are also a number of research projects that should be undertaken in support of these development efforts such as:

1) Make anthropological studies of neighborhoods and schools–which of their characteristics determine social behaviors, where value conflicts are, and what variables might be manipulated to reduce conflict and improve desired behaviors without destroying cultural values;

2) Do comparative studies of the effect of a broad range of work experiences and exposure to work models on later job success and job satisfaction.

2. Cognitive Development

The cognitive development goal is to provide the basic intellectual tools necessary to maximize individual potential in society. To function in our society, every person must at least learn reading, writing, and arithmetic for such tasks as reading newspapers, application forms, and schedules, and budgeting time and money. People should also have enough academic skill to guide their own later education and to allow them to share the symbolic artistry and experience of others.

The target audience for learning basic literacy and mathematics is heavily weighted toward the childhood years. 99 out of 100 children aged 7-13 are enrolled in schools for the primary purpose of learning basic academic skills. Elementary enrollment in this country rose to nearly 37,000,000 in 1969, with 80% of these children in public schools, but by 1970 began to fall in many areas (NCES, 1970, p. 2). Despite universal school attendance, inability to read is a major educational problem for one out of seven elementary school children, for more than one out of five pupils from poor families, and for one out of four eleven-year-olds (White House Conference on Children, 1970). Though most teaching of basic skills is directed toward youngsters, they are not the only target audience. 2.4% of American adults are considered illiterate and 11.3% of 1967 draftees failed mental induction tests (NCES, 1970, p. 13). Though both youngsters and to a lesser degree, adults, are target audiences for teaching basic skills, we would do an injustice if we only taught the rudiments of literacy and mathematics. People must be introduced to the sources of information, skill building, and enjoyment of other people's efforts that come through using

intellectual skills. Students must learn to be their own teachers; that is, they need to know where to go for information, how to use libraries, how to evaluate the information they obtain, and how to recognize their own information needs and share knowledge with others. The heaviest educational need for this academic learning beyond the basic skills occurs in later childhood through early adult years. However, it continues to some degree throughout the adult years, and perhaps increases when retirement brings the need for new ways to spend time.

The nature of the task and the target audiences suggest that NIE needs to consider at least three kinds of R&D activities:

A program to improve beginning reading.

A program to help children learn to use academic skills for their own further education and for enjoyment of the intellectual efforts of others.

A basic literacy program for adults.

a. Basic Skills for Children. We do not know how learning takes place, only some of the conditions that seem to facilitate or impede it. For example, achievement seems more related to family background and peer group status than to systematic school inputs. The most critical failure of our schools, in fact, lies in the number of children from poor and minority group families who do no not learn to read. These children begin below the norm in academic achievement, and achievement differences between them and their advantaged counterparts increase the longer they stay in school (Mosteller and Moynihan, 1972, p. 14).

Federal government attempts to solve this problem of low achievement in basic skills have taken two main forms. One is to provide supplementary or compensatory funds through the Elementary and Secondary Education Act for school districts in poverty areas, with the district deciding how that money might best be spent to improve achievement. This solution, by and large, did not produce consistent or lasting improvement. The second kind of effort was an R&D solution—research on the reading process and development of new reading curricula based upon research evidence about successful reading instruction. Examples of these efforts are basic research sponsored by the National Center for Educational Research and Development, and curriculum development efforts like that of the Southwest Regional Laboratory. Much of the Office of Education R&D funds were invested in such programs, and after six years, some of the programs are just now being completed and readied for implementation. Such curricula should provide a sound basis for instructional sequences.

Though curriculum development efforts are worthwhile, many other variables that do not relate to the sequencing of instruction per se seem to be of overwhelming importance. Recent evidence that Jensen (1969), Herrnstein (1971), and Shockley (1971) have presented suggests the importance of genetic differences in learning styles between lower and middle class children. Much other documentation, however, shows that these children, and children of the poor generally, can and do learn effectively, both in and out of school. Many researchers who study child-rearing practices, for example, have concluded that poor children learn self-discipline and independence earlier than middle class children (Moraus and Lowrie, 1967, pp. 19-41). Though it is the exception, in cities where reading achievement scores are published by school and race, there are invariably schools with a high percentage of minority students where the children have high average scores (Young, 1971, p. 3). Also, various programs of individual tutoring have shown that virtually every child can be taught to read, given enough concentrated attention on that one task (Ellson, *et al*, 1968).

Some identifiable differences in the task that middle class and poor children face when they enter school might explain the failure of poor children. All children are typically introduced to the new and strange institution of school at a given age, when they are almost simultaneously separated from familiar settings, required to adapt socially, and introduced to academic skills. But the change is not so great for middle class children as for poor children. The difference between parents' and teachers' language, reading habits, expectations for the children, expressions of temper, rules for talking and silence, etc., are greater for poor children. This makes their total load of learning much greater and also introduces the pressure of home-school conflict into this learning (Moraus and Lowrie, 1967, pp. 19-41). If some way can be found to reduce this task load for poor children during the initial learning period, they might have more success. There are several possibilities. The

Harvard Preschool Project has identified some maternal behaviors that seem to facilitate children's cognitive growth and ability to manipulate the environment. Such simple behaviors as the parents' availability for moments of quick problem-solving help, or frequently talking and listening to the child, are missing in homes of many poor children (LaCrosse, *et al*, 1969). Middle class behaviors the child will face in school could be introduced to him and his parents within the family's own neighborhood setting; this is being attempted now in Project Home Start of the Office of Child Development. Reading could also be introduced in a more familiar, non-institutional setting. Finally, in typical first-grade classrooms children spend only one-third to one-half of their time in direct instruction. The academic school day could be shortened and focused on direct instruction. At present, the other half of the school day often involves nonsupervised practice activities, such as doing written exercises in workbooks, drawing, etc. The shortened academic day would allow direct tutoring in a neighborhood day care center or having neighborhood adults come into school to participate with students in recreation, social, and tutoring activities.

b. Promoting Independence in Learning. Current classroom instruction typically involves about thirty children with one teacher who schedules activities by groups, tries to get each group as far through a textbook as possible, prescribes a great deal of drill and practice, has few measures of progress, and uses these measures mainly to judge children rather than guide instruction. Day after day, children face an authority situation where they play a subordinate learning role with most activities directed by an adult who is the teacher. Philip Jackson, in his book *Life in Classrooms* (1968), carefully documents this typical learning environment.

Researchers and developers who see problems with this typical mode of instruction have moved in several major directions. One is to structure the learning task into small steps with careful measurement to insure the learner's mastery of each step as he moves individually through the materials. The student depends primarily on program structure for direction rather than on the authority of the teacher. The most extensive effort to follow this strategy is Individually Prescribed Instruction, developed under USOE support, though other programs with computer monitoring of progress also exist.

A second direction of change has been to build learning situations with less obvious structure. The most extensive of these movements has been the British Infant Schools' open education programs. These programs have been enthusiastically supported by some American educators, and several American variations of the British programs have been developed. Evaluation of this approach is difficult, especially in versions that value freedom for the child more than planning of experience. However, the general strategy of allowing the child more choice among activities and encouraging and guiding independent problem-solving is consistent with the concept of facilitating learner independence.

A third popular effort to change the typical classroom setting has been through tutoring programs. Many of these have been very successful. In some cases, when the emphasis has been more on precise methods and achievement, the programs have trained and employed community persons to do the tutoring (Ellson, *et al*, 1968). In other programs, the emphasis has been more upon a helping relationship among students, with the tutors being peers or older children. Two outstanding examples are the Tutorial Community Project in Los Angeles and the Hawaii English Program.

A series of other techniques are being applied to modify the authority structure of the classroom and to promote (among other values) learner independence. Among these are encounter group techniques, sensitivity training, and reality therapy. William Glasser, in *Schools without Failure* (1969), presents a good example of one of the recently developed strategies. None really focuses on cognitive skills as such, but attempts to build an acceptance of these approaches of self and others as a necessary condition to free the student to learn.

All these approaches, including the typical classroom, use technology to some extent. In most cases, however, the technology has been an "add-on" that does not give the learner any more or less control of his learning environment. In all other aspects of his life he is learning to control and use technology to get what he wants. That is, he operates appliances, television, cameras, cars, food machines, Xerox machines, tools, etc. School is one of the very few places where technology is applied *to* him rather than *by* him. Each of the above approaches for developing learner independence should be explored thoroughly, considering the added resource that student access to

technology should provide to facilitate learner independence.

c. Post-Secondary Education in Basic Skills. Statistics on adults in basic education are very incomplete. Though only 500,000 people—about 10% of the citizens who are illiterate—are in USOE's program to develop and demonstrate adult basic education (NCES, 1971), there are many other sources for training. Among them are schools, employers, unions, all levels of government, community improvement organizations, and educational training and consulting companies (Kent, *et al*, 1971, p. 31). Nearly 13,000,000 adults are in adult education of all kinds, including basic education.

There is general agreement on two problems that face adult basic education. One is that adults who lack basic literacy skills are usually too embarrassed to reveal their shortcomings and too convinced of their continued failure to seek help. Therefore, target audiences must be sought out, reassured, and convinced of the value of such programs. The second problem is that isolation of instruction in basic skills, especially for adults, will probably doom that instruction to failure. An example of both problems is the Job Corps, where students were removed from their home and future job setting for instruction. The program suffered from difficulties in recruiting, high cost per pupil, high turnover, and low gains in basic skills.

Adult instruction in basic skills might be especially amenable to experimentation. Place, instructors, and use of technology could be varied, since acquisition of academic skills is not necessarily dependent on the formal school environment, and the subjects do not require custodial care, as children might. The location for learning might be home or factory; instructors might be from the community such as fellow-workers or professionals from other fields, and media might be television or comic books. NIE should test programs where the scheduling is convenient, the setting is informal, and content is related to job advancement, emotional needs, and daily problem-solving to see if participation and success increase.

In addition to completing current programs like the Experimental Schools Program and the work of various Regional Labs and R&D centers, design and development efforts can be undertaken in any of the three general areas mentioned above—basic academic skills for children, education for learner independence, and basic adult education. For example, any of the following efforts could be undertaken:

1) Develop programs which provide home and community based learning, making time available by scheduling later ages for school starts and shortened school days so the community can have the time to assume part of the instruction. Provide places where training is available for parents and other community adults and teenagers so they can learn to help children with reading and other basic skills.

2) Develop models of academic skill building which teach students to be their own teachers, i.e. where to go for instruction, how to use libraries, how to construct things, how to be critical of information sources and how to recognize their own needs and share information with others. A plan for dissemination and provision for incentives must be included here.

3) Develop a television series for literacy training, with monetary incentives for participation and feedback to participants regarding success.

In addition to development efforts, a number of research projects would be useful. For example, in the area of basic skills:

1) Longitudinal studies, beginning in early childhood, of characteristics of successful and unsuccessful learners, with an emphasis on variables that can be manipulated. Adults who do not read or who learned to read as an adult should be included in the sample.

2) Evaluation, cataloguing, and describing of curriculum programs and technological devices that are especially effective in promoting learner independence.

3. Physical Development

Though physical development is in part genetically determined, habits of rest, exercise, and nutrition also have an influence. To thrive physically, people must learn to select a nourishing diet, avoid hazards, be clean, attend to symptoms of illness, and get proper rest and

exercise. Building these health habits depends upon the individual's own awareness of health needs and his access to resources that help him meet those needs. Children learn appropriate health habits through observing their parents practice these habits and through having such items as combs, toothbrushes, etc., available in their homes. Educational programs can also help children become aware of health needs and in many instances can provide nutrition and opportunities for exercise.

a. Societal influences on physical development. The 1968 *Hunger, U.S.A.* report, confirmed by HEW statistics, classes the diet in 36% of American households with low income levels as "poor." Though we cannot experiment with the effects of poor nutrition on children's intellectual growth, such studies with animals indicate a correlation between nutritional deficiency and intellectual functioning. For example, animals who undergo malnutrition early in life show less general exploratory behavior than do animals who are properly fed from birth. Such data, along with evidence that the human brain undergoes a rapid period of growth between one and three years of age, has attached important educational implications to studies in this area (The Association for Childhood Education International, 1969). Though more research is needed to establish the causal effects of nutrition on intellectual functioning, we cannot afford to ignore the education of parents–and through them, their children–in the selection of properly balanced diets. R&D programs should be particularly aimed at low income families where such nutritional deficiencies are greatest.

While cultural, social, and regional differences in work and exercise habits have been identified, how individuals learn to regulate their own cycles of work and rest, activity and relaxation, is not known. There are, however, some national traditions of physical activity (and inactivity) that might be key points for basic change to improve exercise and recreation habits. For example, some medical examinations frequently identify children who have not developed physically according to age norm, but this information is seldom used to plan the child's education. Despite the fact that the extent of individual differences in amount, rate, and timing of growth makes chronological age an unsatisfactory index of physical maturity (Martin and Standler, 1966, pp. 455-463), our children all begin school at the same age and typically continue in lock-step fashion through school with their chronological age-mates. Especially critical periods of development are the early childhood years and adolescence. Grouping all children together at these ages may force inappropriate activities on many.

Another school influence on physical activity comes more directly from the curriculum. A large part of the opportunity for regular physical exercise in schools involves participation in competitive sports. Such participation is usually limited by sex-stereotyping, social-class exclusiveness, and physical ability. This situation results in a small number of athletes getting a lot of exercise while the rest of the student body serves as passive observers. NIE might explore the effects of rigid age-grading and emphasis on competitive sports on the development of exercise and recreation habits. One place to begin is to study the effects of calendar constraints on school eligibility and enrollment, since these affect even the smallest child's activities and may set the pattern for later exercise habits. Physical maturation rather than age might serve as a better criterion of eligibility for physical activities.

Health hazards such as drug abuse, accidents, pollution and crime have also become a serious concern of public education. Many health hazards can be reduced through personal alertness to danger signals and awareness of the results of careless action. However, there is a thin line between practicality and neuroticism in such areas as maintaining security, being clean, and avoiding pollutants. One can work too hard, lock too many doors, avoid too many foods, etc. While people from low income families are high risks for health hazards, some middle class individuals have probably maximized caution at the expense of a relaxed approach to life.

b. Education for satisfactory physical development. Though national campaigns like "Smokey the Bear," drug abuse advertising, and appeals to preserve the ecology can change behavior, the most effective health precautions and habits are probably acquired through observation or practice under positive incentives rather than exhortation. Unfortunately, many parents are not appropriate models of health habits. Schools provide teacher models, but often they are too alien to the neighborhood culture for students to identify with them, and no incentives reinforce imitation. Probably the most effective solution is to identify people in the community to serve as models for children to imitate, and to enlist their aid. Teenagers or community adults are an under-used resource. Where

health education takes place is also important. Places where children receive care, like day care centers, and where people receive medical help, like doctor's offices and clinics, could provide opportunities for building health habits, especially if they are accepted by and employ people from the community.

Because health education means changing identifiable behavior rather than accumulating knowledge for delayed use, the control points for action and the specific target audiences are more easily identified than is the case with other learner goals. For example, in the case of nutrition, the points where food is purchased, and the places where people eat probably provide the most direct access to diet control and therefore may be the most effective points for educational intervention. Consider some examples. Many schools, preschools, and day care centers provide food (most often lunch or a midmorning snack) for children and adults, sometimes with Federal assistance. Although children are in these places at breakfast time and the facilities are available, breakfast usually isn't offered.

In developing health exercise habits, it might be beneficial to locate recreation facilities strategically, or place needed services geographically so that more walking is required. For example, experiments in providing gym or swimming facilities in downtown areas adjacent to low cost and diet-oriented cafeterias, or requiring all parking to be on the perimeter of the commercial area, might yield measurably improved health in a city's working population.

The most effective way to curb health hazards might well be to identify the high risk populations for specific hazards and concentrate most education, service, and incentive investments on them, e.g., a focus on teenagers and overseas military personnel in drug abuse; on young women in birth control; or on young children in accident prevention.

This kind of analysis suggests several developmental efforts that NIE might undertake:

1) Experiment with physical education programs using indigeneous community activities and employing members of the community as directors; also experiment with new locations for cross-age recreation in community centers, vacant lots, lunch-hour gathering spots, or church functions.

2) Develop and assess the effectiveness of advertising campaigns to foster better nutrition; evaluate effects of using neighborhood people to demonstrate improved food selection and preparation practices; develop procedures to insure that the more effective practices become self-sustaining.

3) Establish and evaluate the effects of specialized roles like director of community drug abuse prevention centers, etc., that would address problems of high risk individuals. Such programs, of course, require interagency cooperation.

4) Provide small-group, in-home preschool programs led by community people who are good health models; use these sites as vehicles for longitudinal studies of the effects on learning of providing breakfast as well as lunch for preschool children.

A number of research projects related to education for physical development might also be undertaken by NIE:

1) Survey the literature on the relationship of nutrition to learning, exercise to physical development, and physical development to learning.

2) Identify recreational activities that various cultural and ethnic groups enjoy and the times and places where recreation and exercise could occur naturally in neighborhoods and at work.

B. Enabling Goals

The educational goals discussed thus far have been focused upon improving the development of the individual learner and the operation of the educational system. Under each of these two broad headings, several specific goals have been defined. The success of NIE will properly be judged on the basis of its contribution to the realization of these specific goals.

To make progress toward these goals will demand NIE involvement in a wide variety of activities. These activities will express the Institute's determination to implement its basic goals through effective action. Thus, the more fundamental learner and system goals of NIE

require the specification of enabling goals that will make the achievement of these learner and system goals more probable. Two general enabling goals may be defined: dissemination and personnel selection and training.

Dissemination involves a variety of planned activities designed to promote widespread understanding, acceptance, and diffusion of educational products and processes developed with NIE support throughout the educational system. Personnel selection and training involves attracting and preparing individuals to fill a broad range of educational roles as needed in an evolving educational system. Each of these enabling goals will be discussed in turn below.

1. Dissemination for R&D Efforts

a. Dissemination as a Goal. The ultimate payoff for educational R&D is demonstrable improvement in the educational system. Unlike the pursuit of pure science, R&D in education cannot reasonably be defended as a "good" or "desirable" activity in its own right. Instead it must be viewed as a social investment. If there is little or no return on this investment, society may rightfully question the decision to allocate valuable resources to the activity.

In the last twenty years, largely due to efforts supported at the Federal level, educational R&D has expanded at a very rapid rate in the United States. The relationship between educational R&D on the one hand and educational practice on the other is imperfectly understood, and Federal support for educational R&D has not been guided by any explicit, coherent theory linking the two. By and large, it has been assumed that educational R&D would ultimately improve educational practice through a "trickle down" process; i.e., the best ideas discovered in basic research would automatically suggest developmental efforts which in turn would be followed by product testing in the field and leading eventually to ever wider adoptions in educational settings. It is not generally acknowledged that R&D in education has had a disappointingly small impact on educational practice. Though specific examples of a significant influence here or there can be cited, the day-to-day operation of the educational system seems to have been minimally influenced by the output of educational R&D.

It has been clear since the National Institute of Education was first proposed that the success of its efforts would depend upon more than the development of a program of educational R&D. NIE is expected to have a major impact on educational practice. It must be in the forefront of educational innovation. If NIE is to discharge this responsibility effectively, new methods of translating R&D results into educational practice must be developed and put to work. The goals of NIE, whether defined as changes in the learner or in the educational system, cannot be reached without the development of effective strategies for dissemination.

b. Elements of a Dissemination Plan for NIE. Developing a dissemination plan for NIE involves a consideration of at least three questions:

1) *What* activities are involved in dissemination?

Are all dissemination activities essentially similar or is it useful to distinguish different activities on the basis of what is to be disseminated (e.g., knowledge, a product, new legislation) or who is the target audience (e.g., researchers, teachers, students, parents)?

2) *How* should dissemination be carried out?

Is it helpful to differentiate dissemination strategies and tactics on the basis, for example, of what is to be implemented or who is to be reached?

3) *Who* should have responsibility for managing dissemination activities?

Although it is obviously appropriate to assign responsibility for dissemination jointly to NIE and OE, how can plans be developed to protect the legitimate interests of each agency while at the same time exploiting each agency's unique capabilities?

A first approximation to answers for these three questions is presented in Figure 2, which distinguishes three types of dissemination activities:

1) Information storage and retrieval;
2) Demonstration of effective

What activities are involved in dissemination?	How should dissemination be carried out?	Who should have responsibility for managing dissemination?
1. Informing	1. Standard archival systems e.g. journals, books, libraries, information retrieval systems, etc.	1. OE and NIE (primarily the Bureau of R&D Resources)
2. Informing and Demonstrating	2. Networks of field representatives, light-house schools, demonstration centers, etc.)	2. OE and NIE (primarily the Bureau of Educational Systems)
3. Informing, Demonstrating, and Building Demand	3. Strategies, e.g., manipulation of incentive, removal of legal barriers, etc. developed specifically to meet program characteristics.	3. Dissemination plans to be: -- formulated by NIE (primarily the Bureau of Directed Programs) and -- executed by OE

A Dissemination Model

Figure 2

educational practices; and

3) Building demand for major educational innovation.

c. Building Demand for Major Educational Innovations. One aspect of dissemination is to store information about educational R&D and to organize this information so that it is readily retrievable by those who need and want it. The informational needs of the R&D community are accommodated largely by the familiar professional and scholarly communication channels of which journals, newsletters, monographs and books are major aspects. As the volume of R&D information has increased, however, these channels have been supplemented by more elaborate computer-based systems. While such systems perform a vital dissemination function, they tend to be more inclusive and less selective than is warranted given the quality of much so-called educational R&D.

A second aspect of dissemination is the demonstration of promising educational materials, products, and practices. This function is largely directed at educational practitioners (teachers, counselors, school administrators, etc.). It involves not only providing information about educational developments, although this is certainly included, but also displaying or demonstrating these developments in a tangible manner so that a practitioner can judge their appropriateness for the local context in which he works.

The third aspect of dissemination involves building acceptance of, and a demand for, specific innovative educational programs. The importance of this aspect of dissemination is based on the assumption that one of the consequences of a sound educational research and development program will be potentially significant reforms of the educational system. After such major discoveries have been made, it will be necessary to pursue a strategy for encouraging widespread adoption. This, of course, will involve informing and demonstrating activities, but it will also entail more active efforts to persuade educational practitioners that the reform is desirable or necessary. In addition, it will involve assistance in the installation and continuous maintenance of the innovation in order to insure its successful adoption.

The three activities may be considered to have a hierarchical relationship to one another. Informing is clearly a minimally required activity. Demonstrating, on the other hand, is more complex and must inevitably include the sharing of information. Finally, building acceptance is a still more complex process in which informing and demonstrating are included.

The three activities can also be distinguished with respect to how "neutral" or "objective" they aspire to be. Informing is obviously an essentially neutral activity in which accuracy and completeness are major concerns. A system for informing must store and make available as much relevant information as possible on any given topic of interest to the educational community. R&D reports which meet minimum levels of acceptable methodology should be incorporated in the system. Demonstrating is a somewhat less neutral activity. From among the many products and processes that can claim effectiveness in meeting an educational need, some will be selected for demonstration and display. Others, inevitably, will not be so favored. Implicitly then, a judgment has been made that some products or processes are probably more effective than others, and it is those products and processes that should be demonstrated. Thus, although demonstration is viewed as only an aid to the practitioner, making it easier for him to make an informed choice, the prior judgment of what will be demonstrated necessarily constrains the practitioner's freedom to choose. Finally, building acceptance is the least neutral of the three dissemination activities. Probably only a few educational programs will produce R&D results which can justify major efforts to achieve wide-scale adoption. Although such innovations can have a potentially powerful and positive impact on the educational system, it would be naive to assume that they will be adopted through information and demonstration activities alone. It will be necessary to formulate specific strategies for gaining the required acceptance, and the strategies will almost surely have to be developed to suit particular program characteristics. Building acceptance for a specific approach to career education may involve procedures that are very different from those involved in building acceptance for home-based education of pre-school children.

The third column of Figure 2 presents tentative answers to the question of what agencies should be responsible for managing dissemination activities. It is quite clear that this is a question of major significance. Both NIE and OE have strong commitments to dissemination and each agency will undoubtedly have an important role to play. An exact specification of the relationship between the two agencies is impossible at

this point. The answers in the third column of Figure 2 are designed primarily to suggest that cooperative arrangements, mutually acceptable to both NIE and OE, will undoubtedly have to be established.

d. Making dissemination work. In carrying out its responsibility for insuring appropriate dissemination of its R&D products, NIE will need to take the lead in several key areas.

1) Needs assessment. Before it embarks on a developmental program NIE would be responsible for analyzing educational needs and marketing possibilities. As part of the planning for each proposed program, the Institute would conduct a needs assessment study designed to advise policy makers and to suggest the most advantageous means of disseminating the outcome when it becomes available. In that way the groundwork for dissemination will be established well in advance and R&D outcomes are more likely to reflect realistic educational needs.

2) Planning dissemination strategies. In carrying out its responsibility of implementing R&D outcomes, it is particularly critical that NIE have maximum flexibility to design its dissemination strategies on a case-by-case basis. No single strategy will suffice for the full range of NIE-supported research and development activities. Techniques must vary according to the product, target audience and available resources. Some developments can be implemented directly by teachers while others will require school board or administrative support. Still other developments will depend on the actions of state or Federal legislatures, and others on individual parents or private employers. Obviously different dissemination strategies will be needed to work with different audiences and for different products.

In planning dissemination strategies, the Institute will have to draw on the expertise of different dissemination specialists as needed. These people could come from NIE itself, OE's program staff, other Federal agencies, universities, private industry, state and local public agencies, and so on. Some of these people will be involved in R&D programs, moving on later to help implement and monitor the dissemination effort. In some cases, a few people could be intimately associated with the product over an extended period of several years; others would make specific contributions over a shorter period of time. Through this technique NIE can maintain optimal flexibility and continuity in its dissemination efforts.

NIE planning staff would be responsible for developing dissemination plans in as much detail as possible, during the early stages of program development. This would entail extensive contact with potential outside dissemination agents (other Federal agencies, publishers, professional associations, etc.). Since OE resources will be critical to many of NIE's dissemination plans, NIE will need to be in day-to-day working contact with OE personnel during both planning and implementation of dissemination efforts.

3) Implementing dissemination strategies. When NIE has formulated appropriate dissemination strategies for a product, it would identify appropriate resources—financial, institutional, and human—to carry out the necessary tasks. The Institute might draw on the capabilities of other Federal agencies such as OE, NSF, NIH and OEO; commercial publishing and marketing systems; trade and professional associations; scholarly journals; state agency staff, etc. In some instances, NIE might secure financial commitments from other agencies and organizations to help support a dissemination effort, since spreading improved educational practices is a mission shared by numerous agencies. In other cases, NIE might use its own funds to contract for dissemination services, often with the product's developers.

As dissemination programs go into operation, NIE would retain responsibility for monitoring and evaluating dissemination projects being carried out by inter-agency agreement, contract, grant, etc., on its own behalf. NIE might detail staff to work on the dissemination effort to insure successful installation. In any case, NIE staff would be expected to work closely with whatever organizations might be involved in house or by contract.

4) Basic research on dissemination. The effort to carry out dissemination effectively labors under many severe handicaps. One of the most troublesome of these handicaps is the relative paucity of reliable knowledge about educational

change processes. NIE will therefore conduct research on communication, decision-making and innovation in education. Each program supported by NIE will be an experiment in ways to successfully implement alternatives in education. Studies designed to clarify the ways in which new ideas and practices are disseminated through the educational system will also be undertaken. Although plans for specific projects have not been developed, the following are examples of what might be supported:

Research on obstacles to change. NIE and other agencies will be unable to provide meaningful and relevant assistance either on specific innovations or on the improvement of practice in general without an understanding of why education resists change and how innovations achieve actual widespread adoption.

Invention of alternative procedures for creating an incentive structure in education that will insure a sustained demand for improvement and renewal. Studies are needed that can generate and test alternative models that motivate schools and communities to actively pursue better structures and systems for providing educational services. Perhaps economic studies of the effect of competition in the market place on receptivity to innovation has something to offer on this problem.

Methods of assessing innovations and their intended and unintended consequences. Methods for assessing the consequences of implementing new alternatives must be developed. Such tools, once developed, can be used to monitor the effects of outstanding examples of education practices that are introduced in new settings.

2. Personnel Roles in Education

The educational system is vast and extremely complex. Millions of individuals serve in this system in a bewildering variety of roles; moreover, the functions they perform are dynamic rather than static. The teaching role today, for example, is different from that of 25 years ago (although some would say otherwise) and will almost surely be different 25 years from now. To meet the learner and system goals of NIE, it will be necessary to understand how individuals are recruited into the educational system, how they are trained for the particular responsibilities to which they are assigned, and how these processes can be managed more effectively. Since NIE will be expected to have a major impact on educational practice, it will support programs for selecting and training personnel who can function effectively in an educational system that may differ markedly from the system as we know it today.

Personnel selection and training must be regarded as a major enabling goal for NIE. The ability of the Institute to reach learner and system goals will be critically influenced by the number and quality of the personnel involved in the educational enterprise. Educational personnel will be needed who have some interest in and aptitude for the tasks they are expected to perform. Awareness of and commitment to the broad learner and system goals of NIE will be of great importance.

NIE's responsibility with regard to personnel selection and training must be carefully delineated. Every year tens of thousands of young teachers are prepared in colleges and universities throughout the U. S. Much smaller though still impressive numbers of school administrators, guidance counselors, and educational researchers are similarly prepared. It seems quite clear that NIE cannot and should not undertake to support the vast majority of the programs in which these individuals are prepared. The limited resources of NIE, as well as its R&D mission, preclude support for conventional programs to staff the educational system. The resources that NIE can invest in personnel selection and training will necessarily be focused on innovative programs whose goals coincide with those of the Institute.

a. Choice Points in Planning an NIE Program to Enhance Education Personnel Development. Plans for NIE programs in education personnel development will require attention to several matters, each of which will be discussed below.

1) Role Responsibility in the Educational System. Personnel plans will have to take into account the varied roles individuals play within the total educational system. Among these roles are determining education policy, managing instruction, providing specialized services, and conducting research and development. This list is hardly exhaustive, and as the educational system changes, at least partly through NIE-sponsored

efforts, new roles may emerge while old roles decline in importance or are significantly modified.

2) Personnel Tasks. At least two major personnel tasks can be clearly recognized–selection and training. In the recent past, due largely to a general shortage of educational personnel, training has typically been given more attention than selection. As the shortage of personnel eases, and with an increased emphasis on competency-based measures rather than formal academic degrees as the basis for certification, selection may be expected to take on far greater importance.

3) Present or Future Orientation. As noted above, the educational system is dynamic rather than static. It is therefore possible to consider the development of personnel for the system as it now exists and functions or as it is expected to function in the future. Since the major goal of NIE is to stimulate and guide educational change through the creative application of research and development, the development of personnel for an emerging educational system must inevitably take precedence over the personnel needs of the system as it now operates.

4) Agencies Involved in Personnel Development. A number of different agencies have traditionally had some responsibility in the development of educational personnel, including colleges and universities; schools; laboratories, centers, and institutes; local, State, and Federal government agencies; commercial and industrial organizations; and community groups. At present, personnel development is largely the responsibility of colleges and universities, with only modest involvement from the other agencies listed above. Personnel plans developed by NIE will call for a broader base of participation including the encouragement of consortium arrangements.

b. Possible NIE Pollices for Support of R&D on Education Personnel Selection and Training. Plans for NIE's support of personnel selection and training cannot now be formulated in detail. It is possible, however, to state some general policies that can guide the development of these plans. Among these policies are the following:

1) NIE will be concerned with the selection as well as the training of educational personnel. Efforts will be encouraged to broaden the base of participation in the educational system by recruiting individuals who are now effectively excluded.

2) NIE will encourage efforts to "open up" the certification of educational personnel through the development of alternative paths to credentialing. Performance-based measures of effectiveness in carrying out defined educational responsibilities will be central to this effort.

3) Support decisions will emphasize the needs of the emerging educational system for NIE's goals to be realized effectively. Conventional and routine programs designed to prepare individuals for existing roles and responsibilities in the system will not be supported.

4) Support for relevant personnel selection and training activities will be built into NIE's major program areas. Additional support–not specifically related to major program areas–will also be available, but only if the personnel activity offers an innovative alternative to conventional practice.

5) NIE will encourage a variety of personnel-related activities, including research designed to clarify emerging personnel needs in a changing educational environment and to yield practical procedures for selecting individuals to fill major educational responsibilities. Also to be included are innovative programs of personnel selection and training focused on the emerging needs of the educational system, and projects for selecting and training personnel to undertake responsibilities associated with the major program efforts sponsored by the Institute.

c. Personnel Development for Educational R&D. In the past, R&D personnel in education have been drawn largely from the ranks of psychologists. Two related consequences have followed:

1) Educational R&D has had a tendency to focus on primarily psychological variables and explanatory principles with only a limited attention to variables, insights, and methodologies derived from other disciplines (e.g., anthropology, sociology, economics, political science, etc.);

2) Educational R&D has been dominated by theory-oriented, narrowly focused investigations that meet limited methodological criteria at the expense of more applied, and less narrowly rigorous, efforts. The "R" in R&D has proven more attractive to investigators than the "D."

In the future, R&D personnel in education will have to deal with a broader range of phenomena; they should therefore be drawn from a broader range of disciplines. Applied studies, drawn from real-world educational problems, with definite implications for educational policy, will become more and more prominent. For NIE this will mean:

1) More vigorous efforts to recruit anthropologists, sociologists, economists, and political scientists into educational R&D work;

2) More support for programs to prepare educational R&D personnel in which anthropology, sociology, economics, and political science play a major role;

3) More emphasis in graduate training programs on the applied, developmental, and engineering aspects of educational R&D. Bright young people from a wide range of disciplines should be induced to apprentice themselves to the most able education problem-solvers in the country.

The manpower needs for educational R&D today are comparable to those for clinical psychologists shortly after World War II. These needs, however, will not be met merely by preparing more psychologists or more social scientists from other disciplines. A new type of researcher, one who can split his time between task-oriented and discipline-oriented efforts, is required. Training programs will have to identify and prepare individuals who are as interested in the application of theory as in the theory itself. Just as economists move easily back and forth between their universities and Washington, educational researchers of the future will have to feel at home in the university, the schools, the community, the private sector, and NIE. They will have to establish working relationships with each of these agencies, similar to their relationships with the library and the computation center.

The training of research and development personnel in the area of educational technology is another problem to be considered. The constant growth of technology means that those individuals being trained today cannot merely be taught the techniques and methods of the present. They must be trained rather for the technology of the future, where computers and other new media will be the rule rather than the exception. Closed-circuit television, for example, should be exploited to its capacity, since it is a potentially useful tool not only in the classroom but in teacher training as well.

Another manpower problem is especially striking in light of the NIE's mission to foster equality of educational opportunity. Programs aimed at upgrading the quality of education for minority groups will not be successful without the cooperation of the ethnic groups themselves. However, many blacks question the relevance of educational R&D as a career. Those who do find their way into this field are often labeled "Uncle Toms." Widespread ethnic support of the programs of the NIE should therefore be cultivated.

C. System Goals

1. Productivity

The goal of productivity in education is to make more effective use of its expanding level of public resources. To reach this goal it is necessary to (a) have measures of school effectiveness, (b) develop new technology, and (c) obtain information about the educational sector.

a. Measures of Educational Effectiveness. Despite the enormous amount of research into the nature and process of education, little is known about how students learn and how instruction relates to this process of learning. This absence of a theory of learning and instruction makes research on the relationship of various inputs to education, such as school facilities, curriculum, qualification and allocation of teachers, etc., to educational outcomes, such as personal, social, and cognitive goals, critical. To increase productivity, we must not only define such relationships, but select as inputs those variables which can be manipulated in order to most effectively accomplish the desired outcomes. Burkhead (1967), Hanushek (1968), Katzman (1970), Bowles and Levin (1968), and Guthrie, *et al* (1970), have provided an initial step in this direction. One of the

widely recognized shortcomings of these studies, however, is the lack of appropriate or adequate measures for both the inputs and outputs of education. Some form of measurement in terms of both quantity and impact is a prerequisite to the formulation of programs that foster effective education.

Project Talent and the National Assessment of Educational Progress (NAEP) have both attempted to measure the effectiveness of education; however, the conclusions which have been drawn by both studies still do not identify what variable might be altered to increase that effectiveness. More longitudinal studies of student learning are needed to relate the observable outcome of the educational process to specific items in a person's educational history, including family and community influences. A new study, the Longitudinal Study of Educational Effects (LSEE), has been initiated by USOE to develop a broad range of measurable criteria for school effects beyond retention rates and scores on standardized achievements tests. The results of such studies provide the basis for more efficient allocation of resources to achieve more effective education. High priority areas for NIE research and development include:

1) Multidisciplinary research on learning by biochemists, psychologists, neurophysiologists, etc,;

2) Accurate measures of the outcomes of the educational process with particular emphasis on criterion-referenced testing and observational techniques of measurement; particular emphasis should be given to the development of outcome measures in the areas of social and emotional development in contrast to the usual emphasis on cognitive development;

3) Longitudinal studies which identify those educational conditions that are effective in producing given outcomes, when factors such as community patterns, ethnic groups, peer groups, etc., are taken into account.

b. Educational Technology. A large part of the increased standard of living in American society is due to technological change. For example, through development of new production techniques, a smaller amount of labor and money yields far more commodities than was possible a few decades ago. Educational productivity has not increased in a like amount, in part because teaching is a process of interaction and technological substitutes are not easy to develop. Nevertheless there has been some progress in applying technology to education. For example:

1) Indirectly, the impact of technology in other sectors, such as agriculture, industry, and entertainment, has affected education via the increased sophistication of students when they enter school, the specialization of adult activities, and the standardization of values through mass media communication;

2) The application of such items as television, projectors, tape recorders, etc., has had some effect on instructional content, mode of presentation, storage and retrieval procedures, and classification of material;

3) Recent attempts to engineer educational situations to achieve desired results are a higher level application of technology, involving new educational models that restructure the use of materials, facilities, equipment, and incentives and make more efficient use of student and teacher time and facilities.

These examples of three different levels of technological influence have generalizable implications for education. First, the rate of change and level of technological development creates the context in which the educational system must operate. As such, technology places demands on the educational system to provide for specific types of training and adaptability. Second, technology may provide devices that are useful for making educational resources more effective. Third, and probably most important, technology has set the stage for a shift in thinking about educational productivity; i.e., the use of technology to put the student in charge of his own education—teaching him to formulate problems for himself, to seek and use information, to be in command of the technology, to evaluate his own work, etc. This necessitates a change of reference from the teacher as the productive element to the student as the productive element.

Technology and all of its ramifications offer opportunities to make education more productive. The remedy, however, is not simply computer-assisted instruction, or team teaching, or instructional television. These innovations must be integrated with more

traditional resources in order to make a difference. The Commission on Instructional Technology (1970) has described the importance of sound development work on technology with plenty of evaluative feedback from field testing to enable cycles of revisions and improvements to be made. "Sesame Street" and the "Electric Company" are probably the best large scale efforts in this direction, illustrating the value of programmatic development using formative evaluation-revision cycles to improve the effectiveness of instruction.

To build on past efforts to improve the use of technology in education, NIE should undertake a number of new activities. In development, the major concerns should be:

1) To develop instructional programs which put the student in command of educational technology, so that he can use devices to select his own educational experiences, determine how long he will participate, move from one resource to another to solve problems, assess his own progress, and reschedule activities when he needs to learn more;

2) To develop model applications of technology which permit adequate time and provide effective incentives for parents, students, and community resource people in education;

3) To develop efficient administrative structures; in particular, administrative and financial systems must be developed which foster efficient state and local school administration;

4) To develop mechanisms whereby people outside the school sector, in government, industry, business, and other fields may cooperate with educators and assist in the production and modification of educational services; shared use of existing institutional resources outside schools and colleges may provide a promising path toward increasing education productivity.

Related research activities include: identification of incentives necessary to encourage adoption of new and effective educational programs; research on efficient utilization of time (previous analysis of school effectiveness overlooks student and teacher time as a constraint to the learning process); and research on using peer tutors to increase productivity in education.

c. The Information Problem in Education. Without appropriate information, public desires for educational services are unknown to educators and the public has little basis for exercising its educational options. Information is necessary for intelligent societal participation in school decision-making, but the real issue is to determine what information is needed and how it can be most usefully disseminated. Hanushek and Levin (1968) have discussed this problem, while Coleman and Karweit (1970) have analyzed multi-level information systems. Some of the findings of their analysis may be subjected to experimentation in a Los Angeles school district. In addition, Jencks (1970) has discussed the information which would be required by a voucher system. Despite this work, a comprehensive information system has yet to be devised.

Possible NIE activities that could significantly fill the information gap include:

1) Developing a formal theoretical framework for the education industry that would define a relevant system for the efficient collection, evaluation, and dissemination of information necessary for effective decision-making;

2) Developing key social and economic indicators that permit evaluating the quantitative and qualitative developments in education.

2. Access

Education can provide the basis for a productive, meaningful work life, creative use of leisure time, and the skills important in social and community development. On the other hand, limited access to education can become personalized in poverty, unemployment, crime or in many other forms of wasted human potential. The access goal implies an allocation of resources which equalizes the access to educational services. It seeks to provide a greater number of learning experiences for those whom the school and college system does not currently serve.

This section discusses the following aspects of providing equal access to education: (a) definition of educational needs, including the specification of target groups to be served; (b) development of expenditure and

taxation schemes which equitably provide for services to meet these needs and make them widely available; and (c) creation of an incentive system which facilitates a sustained provision for equality of access.

a. Educational Need. It is commonly accepted that some students require more help than others to get the most from their education. The measurement of relative need, therefore, is a relevant issue for allocating resources to improve access. Such measures should be objective, unambiguous, and just. There are two broad approaches to measuring need–direct measures of actual pupil performance or the use of social predictors, such as family income.

Direct measures, such as achievement tests in reading, mathematics, social science, etc., could be used operationally to determine need. However, there are basic criticisms of these measures as a guide to student performance and to resource allocation. Some of the major problems (as cited by McKinsey & Co., 1970) include:

1) "The tests currently available do not deal with some of the most important aspects of pupil development–i.e., ability to deal with people and sense of personal worth."

2) "Providing extra resources on the basis of achievement tests might actually result in 'rewarding' unsuccessful educational programs or ineffective teaching."

3) "Allocations might 'seesaw' undesirably; needy districts would receive extra funds; then test scores would improve, and they would lose the funds; the scores would decline; and so on."

The serious nature of these problems has led some researchers to propose the use of social, economic, and environmental factors as a basis for defining student need. For example, family income, parents' education level, pupil mobility, ethnic group, etc., are sometimes used to develop an index of educational disadvantage. This index provides an operational estimate of additional educational resources necessary for equalizing outcomes. Compelling evidence supports the necessity for this type of allocation scheme, if any real equalization is to occur. For example, the now famous Coleman Report (1966) documented the critical roles of social and economic status as a determinant of educational outcomes. More recently, Garms (1971), in a study which employed 30 variables to measure socioeconomic status, documented the relationship between low socio-economic status (SES) and low achievement. He found that, using 30 SES variables, it is possible to predict about 65% of the variation among schools in the percentage of children below minimum competence in reading.

While this approach overcomes the major problems of the "outcomes" approach discussed above, there are other objections to such measures–the accuracy and validity of some of the current research is still questioned; indirect measures do not reflect performance; the information required (e.g., family income by district) is not readily available; and such data is also subject to manipulation that might distort achievement of desired results. Also, we have no reason to believe that giving more educational dollars to the disadvantaged student will markedly reduce the achievement gap.

The Presidents' Commission on School Finance (1972) has investigated the process of developing an educational need index. This places a special emphasis on the development of relative weights for the allocation of resources. The National Educational Finance Project (NEFP) assigned relative values to a variety of educational needs; although these values cannot be considered precise, they do offer a start for such development. Groups for which an above average need has been identified are: preschool children; the mentally and physically handicapped; adolescent drop-outs and push-outs; adults desiring career education; the institutionalized; and older people. Although NIE cannot develop programs for all of these groups, sample or pilot programs suitable to some groups should be within the Institute's capability. The first effort for any sub-group should be to survey current programs and needs.

It is evident that further effort must be made to formulate operational allocation schemes based on educational need. R&D efforts for NIE in this area should include the following:

1) Determining the value of socio-economic status variables in predicting educational success;

2) Developing programs to capitalize upon under-used community resources (e.g., school buildings at off-hours, days and seasons; industrial course offerings; voluntary instructors; retired experts in various fields, etc.) to provide needed educational services;

3) Developing mechanisms to increase access to institutions of higher learning; full-costing may be a significant step in that direction;

4) Developing a means to inform state and local authorities and other Federal agencies on the costs and benefits of new educational services, e.g., education for the elderly would be of interest to the Administration on Aging, and the NIE would design its research to provide policy-relevant data to the AOA.

b. Revenue and Taxation Schemes for the Provision of Equal Access. Access to educational opportunities and the financing of education must be examined together for several reasons. First, the current system of finance results in widespread inequity. This occurs because the methods for raising and spending money for education guarantee that children who are born to wealthy parents will ordinarily receive a better education in the public schools than children born to parents in a lower social or economic class. Second, even if substantially more funds were made available to education, unless the system of raising and spending money were to change, the same relative inequalities of educational opportunity and access would persist. Third, the provision of education and training for some of the currently unserved target groups described above requires additional tax revenue.

Numerous studies have recently documented the serious nature of the disparities in both expenditures and tax burden between school districts within and between states. The Senate Committee on Equal Educational Opportunity (U. S. Senate, 1972) and the NEFP have carefully documented inequities in the use of local property taxes as a prime source of funds for education, and recommend a basic restructuring of financing and expenditure patterns. Several recent studies have developed a considerable amount of data documenting existing inequalities (including the basic inadequacies of current state equalization plans) and proposed a wide range of plans and formulas for alleviating or potentially eliminating them. (See Coons, Clune and Sugarman, 1970; Guthrie, *et al*, 1969; NEFP, 1971; the President's Commission on School Finance, 1972; and the New York State Commission on the Quality, Cost, and Financing of Elementary and Secondary Education, 1972.) The plans present a range of alternatives which basically include:

1) Full state assumption of education costs, with revenue generated from a state-wide (sales, value-added, income, or property) tax;

2) Power-equalizing state aid--a system by which disparities in locally raised revenues are compensated for (in total or in part) on the basis of local tax base and local tax effort;

3) Redrawing school district boundaries to equalize property valuation;

4) Revenue distribution systems that equalize expenditure on absolute terms or in proportion to some definition of educational need; the most widely discussed plan of this type is the "education voucher."

These alternatives have taken on increasing importance and have been subjected to considerable debate as state courts in California, Minnesota, and Texas have invalidated state school finance laws. In addition, state legislatures (e.g., Minnesota) have either proposed or are considering legislative action to alter school finance systems. Public opinion is also mounting in favor of change, although the most politically acceptable directions for change are still unclear.

Both the researchers who document the existing inequalities and those who propose alternative plans agree that meaningful change must consider the following:

1) The higher cost of education associated with (a) pupils with learning disadvantages, (b) regions or school districts with higher living costs, (c) areas with heavier than average fiscal responsibility (e.g., "municipal overburden");

2) Taxing schemes that draw their revenues from tax plans characterized by

progressive rather than proportional rates; even the property tax could be restructured as as progressive tax;

3) The development of a tax and revenue scheme designed to deal with the special problems of large cities of the nation; the Select Committee on Equal Opportunity (1972) has shown that inner cities may actually suffer from several new financing schemes under consideration.

Although each of these areas of fundamental reform must begin and be centralized at the state and local level, recent studies, such as New York's Fleishman Commission Report, have proposed that the Federal Government assume a much larger role in providing educational funds, sometimes up to 30 percent of total educational expenditures. This complication of governmental levels suggests that an interagency effort, even for research and development, will be necessary to achieve equitable financial schemes. NIE can make potentially important contributions through the following kinds of R&D efforts, carried out alone or in relation to other agencies.

1) Define the most well-developed formulas for equalization and work closely with the states in developing the formula variation most suited to their circumstances. This includes an investigation of ways to facilitate change at the state and local level—considered in detail in the following section on incentives.

2) Develop systems for state and local accountability. Education officials should account to the public for their decisions and the results obtained. This includes statewide evaluation systems to measure the effectiveness of educational programs and comprehensive dissemination of that information to the public.

3) Evaluate the effects of revenue sharing as a vehicle for dealing with the special problems of educational finance (e.g., inner city schools). Considering the financial problems of states and local districts, federal revenue sharing, both special and general, may be necessary to allow states to fund quality education adequately for those groups in need of services.

c. Incentives. One broad impediment to the provision of equal educational opportunity is the lack of incentives to individuals and state and local governments to promote change in the status-quo. The present system raises a considerable amount of money, is entangled with vested interests, and has become so bureaucratic that it is difficult to alter. NIE has the responsibility to foster such change by providing information on the means of achieving public acceptance of proposed programs. An important factor to be considered here may be financial incentives.

A large body of research deals with how public opinion is changed, how attitudes and values shift over time, and how people respond to various sanctions (such as legislative decisions). However, there has been little effort to develop an environment which creates public awareness and willingness to do things differently once a goal has been changed. The current fiscal situation not only poses a problem to be solved, but also provides a vehicle to study such public behavior change. A prime example of the difficulties in this area is the segregation-integration conflict in American society. It has been nearly twenty years since the United States Supreme Court, in *Brown v. The Board of Education of Topeka,* struck down the doctrine of "separate but equal" and held unanimously that enforced racial segregation of schools was inherently unequal. Yet, desegregation is an agonizing process which has proceeded in an extremely slow fashion. There is, then, an explicit need for the development of mechanisms which encourage acceptance of new societal goals.

Such mechanisms imply a heavy emphasis on financial incentives to adopt new developments; possible funding sources include emergency school assistance, revenue sharing, grants, etc. NIE can play an important role in the incentive area—even though the major source of long-term funds is the Federal Government, of which NIE is only a small part. Priority concerns should include the following:

1) A survey of sociological research on public behavioral change to identify legal influences, incentives, information campaigns, etc., that can be manipulated to facilitate public acceptance of just but unpopular policy changes;

2) After a program has been chosen, selection of a few states or districts for in-depth

case study (Selection could be based on how prototypic a state is, its willingness to accept NIE staff study, its apparent readiness for change, or any combination of these factors.); implementation of the program in these experimental sites, providing financial and planning aid in conjunction with continual evaluation efforts;

3) Development of mechanisms to inform state and local authorities about generalizable elements of reform programs; this includes feasibility in real settings, legal and administrative changes needed to implement the programs, incentives which foster implementation, and degrees of change that are publicly acceptable.

3. Participation*

The purpose of citizen participation is to make education more effective and reduce alienation by 1) providing educational options that are responsive to the unique needs of each community, and 2) developing new mechanisms for decision making.

A number of studies have demonstrated that participation increases educational effectiveness and reduces alienation. For example, Flanders (1951) and Faer (1949) indicate that student-centered, democratic, participatory classrooms are characterized by less hostility toward teachers, less conflict among the students, and even greater actual learning. A study by Flizak (1967) indicates that a teacher's interaction with his students may be a function of his ability to participate in school decision-making. Cloward and Jones (1963) note that parental involvement in school affairs has a positive correlation with their evaluation of the importance of education, as well as with their attitudes toward the school as an institution; while Schiff (1963) has shown that parent participation and cooperation in school affairs lead to greater pupil achievement, better school attendance and study habits, and fewer disciplinary problems.

Chilman (1966) states that the parental patterns most characteristic of the very poor are anticipation of failure and distrust of middle-class institutions, such as schools. Also, Clark (1964) has documented that children growing up in the inner-city sense, at an early age, their parents' feeling of powerlessness and some soon come to assume that they also have little control over their fate. Finally, Seasholes (1965), in an analysis of the political socialization of Blacks, states that when parents exercise control or power in the school and community, they convey this sense of control to their children; and that these children no longer view themselves as powerless and lacking in self-worth. These findings, as well as the findings of other studies, support the thesis that when parents have a part in the decision-making processes of education, their children are likely to do better in school.

In spite of the evidence attesting to the significance of lay participation for the school's effectiveness, only a few educators are willing to have citizens participate. The majority of schoolmen have been content not to move, seeking to protect the status quo by adhering to traditional citizen participation via such innocuous groups as PA's or PTA's (Moffit, 1967). That is, they are fearful of meaningful citizen participation, seeing it as a threat to their power in the schools.

Furthermore, while school administrators developed bureaucratic decision-making structures, teachers, finding themselves remote from the formal centers of power, have succeeded in developing militant teacher organizations, patterned on a union model (Guthrie, 1971). Union contracts are increasingly, through the bargaining process, specifying salaries, fringe benefits, and working conditions. In many instances (for example, the UFT contract with the New York City Central Board of Education), the contract prescribes rather narrowly the tasks a teacher can be required to perform, and the reasons and circumstances under which a teacher may be transferred or dismissed. The result is that the teacher is insulated from effective scrutiny and evaluation.

Because of these shortcomings in current mechanisms for participation, any program designed to promote citizen decision-making power should consider availability of choice in educational services and mechanisms for citizens to participate and schools to allow it. Each of these topics is discussed below.

a. Availability of Optional Educational Programs. The question of what to teach and how to teach in American public schools has always generated conflict among groups and individuals, both professional and non-professional. Despite the sharp divergencies among all of the groups which affect the present

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* This section was prepared at the Center for Urban Education.

decision-making process in the schools, there are limited observable differences in the educational programs in the public schools through the 19,000+ school districts in the fifty states.

Parents who have the financial means have been able to select a school which emphasizes the values and objectives they consider most important for their children by enrolling their children in private schools. In recent years, the private school sector has expanded with the development of "free schools" and the increase in enrollment in the established private and parochial schools. Low income people are as concerned about the education of their children as middle income people and also view education as the instrumental means for the economic mobility of their children. However, basically for financial reasons they have been unable to make choices for their children and have been required to accept the single available model in the public schools.

There is little empirical evidence to demonstrate the superiority of specific educational models and there is also disagreement among parents as to the values and objectives that schools should emphasize. Therefore, the public schools should become more pluralistic—that is, there should be a variety of educational models in each school district to offer parents a choice and accommodate the varying educational goals and expectations of parents and students.

Alternative schools on an individual school basis or a K-12 experimental design are being established, but they are being created from the top down. In a top-down process, professional educators and/or university-based scholars from various disciplines design alternative school models and seek cooperating districts in which such models may be established. Parent participation is solicited in parental choice as to whether or not their children will attend the "experimental" school, but the key decisions about philosophy, goals and objectives for the educational model have already been made by the designers. Essentially, parents have a choice between the two educational models, but they have not had the opportunity to participate in the actual design and creation of the alternative. Clearly there is a gap between practice and achieving the goal of citizen choice of educational alternatives. NIE should undertake the following activities to fill that gap.

1) Development. Support the community planning and development of new educational programs in keeping with citizen goals. From these available options, each family could then be free to make choices in keeping with its values and goals for its children. Possible options might be the traditional, graded model that emphasizes cognitive skills; the nontraditional and nongraded (e.g., the British primary schools); models that stress the vocational approach (learning by doing); the community school (the Flint model); the multi-cultural school (San Francisco); the schools without walls model (Philadelphia) and so forth—or working with the school-personnel, citizens could develop their own models.

2) Research. One of the main criticisms leveled at the educational profession is that educators are "mediocre." The critics claim that the more capable people go into medicine, law, government, and other such fields, but that those with only average talents enter teaching. Research should be initiated to determine whether this is fact or fiction. Another topic that deserves attention is the feasibility of eliminating the influence of wealth variation on education while at the same time locating within the family the responsibility and the freedom to choose among educational options.

b. Mechanisms for Citizen Participation. Current mechanisms for citizen participation are often ineffective. The school board has major responsibility both to promote participation and seek the advice of citizens so that they are informed about achievement, school programs, their needs and weaknesses. However, Rice suggests such action may lessen the board members' chances for reelection. He also points out that the advisors who are on the superintendent's staff (as is traditional) may be obligated to make the superintendent and the whole school look good (*Nation's Schools*, 1967). Levine (1966), in pointing out the problems of promoting citizen participation at the local school level, emphasized that it is natural for a principal to seek the good opinion of those for whom he works since promotion and stability of position depend on favorable evaluation. Dyer (1958) and Frey (1970) point out that the principal is the key person who will determine whether progress in functional participation is promoted or arrested. This means that if the "do-nothing" approach to citizen participation is to be overcome, the will of the community must be effective in providing local participation in the support and

control of their schools. However, the community must be informed in order to exercise this will constructively; and since the professional is not fulfilling his responsibility to inform the public about the educational needs of their children and schools, some other means must be found to inform the citizen.

Several unique experiments, like voucher systems and performance contracting, are underway to improve mechanisms for decision-making. NIE should evaluate these and try other approaches like the one described below.

1) Development. A politically neutral community education agency, where the needs, aspirations, and rights of community residents *and* school personnel can be articulated, transformed into programs, and implemented in the educational system might provide the mechanism for community control over education. The vested interest of most current educational structures and many other community organizations would be mediated by such an agency.

The agency could serve as:

a) an information center, serving both community residents and school personnel;

b) an agency to explore placing power in the hands of each family to select education it desires for its children;

c) a coordinating center linking the school with various agencies and resources of the community and placing students there for education;

d) a means of developing school governing committees and citizens' advisory councils.

e) an adult education center, to provide activities not otherwise available;

f) a vehicle through which citizens can learn to tackle other community problems, such as better lighting, zoning control, police protection, drug addiction, etc.

2) Research. We need to know about the kinds of information possessed by citizens regarding their local schools and also the kinds of information they would like to have about their schools. Apart from a few opinion polls, little work has been done in this area.

The degree of sensitivity of citizens toward school problems is another area in which research should be undertaken. This is important since their sensitivity will influence their willingness to cooperate to find solutions to such problems.

Research is also needed to determine the most effective mode of conveying information to citizens regarding their schools. Some schools have used home visitors, for example, who are members of the community employed as aides by the school. However, many parents view this as evidence of the teachers' unwillingness to become directly involved with them because the teachers view them as being of lower status.

Finally, efforts should be made to determine whether parents really want to exercise the right to choose from among various educational options. It is possible that parents would be satisfied with whatever the schools do, as long as their children are learning.

D. Criteria and Selection of New Programs for the NIE Agenda

The criteria for selection of new programs to be included in the R&D agenda for NIE were 1) significance of the program to one or more goals and balance of programs across goals; 2) appropriateness for the agency; 3) allowance in the total agenda for most people who need educational services and for use of a broad range of resources for education; and 4) inclusion of programs in basic research, practice improvement, building R&D capability, and solving problems.

Cost estimates and constraints to implementation were also considered, but will be developed in more detail as the feasibility of programs is studied.

1. Significance to goals.

The discussion of learner, enabling, and system goals each led to suggestions for major research and

development efforts. Often, similar suggestions appeared under more than one goal, and combinations of suggestions fell neatly into clusters that could be incorporated into one comprehensive program to address some major problem. Finally, once those clusters were identified and labeled, some of the activities that originated within USOE and are continuing in NIE could be classified within the comprehensive program.

One cluster of activities seemed to fall into the early education area, with particular emphasis on home care rather than institutional care. The education was to promote social-emotional and physical development, supplementing the school in the cognitive area. Some form of this suggestion appeared in all learner goal areas. Supporting suggestions came from the access and participation goal discussions, in the form of programs to involve community people in education. This programmatic area was labeled *Home-Based Early Education*. A number of the Regional Laboratory and Center activities, such as the Appalachia Educational Laboratory's effort to use vans to bring parent education to remote communities, fit this programmatic area. In addition, the Office of Child Development has activities in this area that should allow cooperative effort between the two agencies.

A second cluster of suggestions related to restructuring instruction, especially academic skills. The purpose was not only to make that instruction more effective, but to put choice of educational experiences, control of media, time for presentation, and level of effort in the hands of the learner himself. The cognitive development discussion proposed this effort as a way to build academic skills more effectively. In the productivity goal it appeared as an effort to make education more efficient. Finally, it was suggested as a necessary concomitant of self-confidence in the social-emotional area, and as a way to facilitate access to education after the period of formal schooling is complete. The program was labeled *Learner-Controlled Instruction*. Though most current curriculum activities are not aimed at learner control per se, some are designed to promote individualization and thus might provide a starting point in this program. Such activities are classified in this programmatic area, along with new program starts.

A third programmatic cluster centered around the breakup of educational monopolies. This was mentioned in several goal contexts—to provide access for poor people to higher education, to make education more sensitive to community needs, to tap wider resources by allowing community participation, to reduce student alienation, and to make education more efficient by offering single services to students rather than whole packages. Since the area seemed large enough to incorporate two programs, and the most natural break was at the point of entry into higher education, the two programs are called *Unbundling Higher Education*, and *Community Education Agencies*. Unbundling Higher Education involves identifying functions provided by universities and colleges and providing them in modular form, sometimes using new resources to furnish them. The program for community education agencies was also implied in several goal areas. However, the clearest call for a developmental project come in the participation area.

Figure 3 presents a list of the comprehensive programs, both old and new, and goals for which they are most significant. Every program must include a component for selecting and/or training required personnel and for dissemination, so these are not on the goal list. Though the assignment to goals is obviously subjective, the figure does show that each program is related to several goals and there is a balance of programs across all goals.

2. Appropriateness to the Agency.

Some program suggestions seemed more appropriate for another agency or for joint-agency projects. Many of the R&D suggestions in physical development and in personnel selection and training fell into this category and thus were not recommended as part of the 1973 agenda. Other programs, like the Home-Based Early Education Program, are very appropriate, but should be coordinated closely with efforts of other agencies. The NIE Planning Unit is already working with a coordinating agency in this area, the Interagency Panel for Early Childhood Education.

3. Allowance for all target audiences and a broad range of resources.

After suggestions were consolidated to make up comprehensive programs, these were checked against a list of target audiences and possible resources to assure coverage. The results are shown in Figures 4 and 5. Again, the classifications are subjective, but the balance of coverage seems clear.

PROGRAMS \ GOALS	Social-Emotional Development	Cognitive Development	Physical Development	Productivity	Access	Participation
EXPERIMENTAL SCHOOLS		X				X
CAREER EDUCATION	X			X	X	X
HOME-BASED EARLY EDUCATION	X		X		X	X
LEARNER CONTROLLED EDUCATION	X	X		X		
UNBUNDLING HIGHER EDUCATION		X		X	X	X
COMMUNITY EDUCATION AGENCIES	X	X	X		X	X

* This matrix identifies the goals which each program fulfills. The enabling goals, dissemination and personnel, are incorporated in every program.

Relevance of Programs to Goals *

Figure 3

TARGET AUDIENCE ↓ / PROGRAMS →	Experimental Schools	Career Education	Home-Based Early Education	Learner Controlled Education	Unbundling Higher Education	Community Education Agencies
INFANTS AND PRESCHOOLERS			X			X
ELEMENTARY SCHOOL CHILDREN	X	X	X	X		X
TEENS	X	X		X		X
ADULTS		X		X	X	X
COLLEGE ATTENDEES		X		X	X	
ELDERLY				X		X
HANDICAPPED	X		X			X

* This matrix identifies the principal target audiences to which each program applies.

Relevance of Programs to Target Audiences *

Figure 4

PROGRAMS → / EDUCATIONAL RESOURCES ↓	Experimental Schools	Career Education	Home-Based Early Education	Learner Controlled Education	Unbundling Higher Education	Community Education Agencies
HOME		X	X			X
COMMUNITY		X	X		X	X
INDUSTRY	X	X		X	X	X
SCHOOL	X	X	X	X		
COLLEGE					X	
TECHNOLOGICAL DEVICES		X		X	X	

* This matrix identifies the principal educational resources available to each program.

Relevance of Programs to Educational Resources *

Figure 5

4. Balance of research, practice improvement, R&D improvement, and problem solving.

Most continuing programs, such as the Experimental Schools and the work of the Regional Labs and Centers were heavily concentrated in practice improvement. This load of already-committed budgets makes the NIE 1973 R&D agenda unbalanced. We tried to overcome this in several ways. First, most new program suggestions accepted for the agenda were comprehensive, problem-solving efforts, or were in the area of goal-specific research rather than in the practice improvement area where the budgets were already heavy. Examples of the new goal-specific research suggestions are: information collection for R&D needs assessment, studies of school finance, and research on possible changes in credentialing educational personnel.

Second, new efforts to be suggested in the area of Researcher Training will involve tying some researcher training apprenticeships to the comprehensive programs and increasing the training function of the small grants program. Finally, many dissemination efforts, as well as most R&D on selection and training of educational personnel, will also be made an integral part of comprehensive programs, to add emphasis to problem-solving efforts.

This allocation of programs and budgets within units will make a reasonable balance in the NIE agenda: about $20 million in Resources and Researcher Training, about $55 million in practice improvement and about $45 million in problem solving.

III. DETAILED PROGRAM DESCRIPTIONS

The following program descriptions integrate ongoing and new activities into one R&D agenda for NIE. The agenda is tentative, since this analysis is only one source of new program suggestions and continuing programs must undergo an evaluation during the spring of 1972 before they are accepted into NIE.

Because almost 80% of the 1973 budget was already committed to ongoing programs, separate strategies for old and new programs were required to generate the agenda. Both strategies began with the Learner Goals, Enabling Goals, and System Goals that were derived from the opinions of many people. However, existing programs could not be derived from goal analysis; they could only be identified and classified by goal, with tentative budget allowances. New programs, in contrast, were derived from the goal discussions and accepted as suggestions when: 1) they met the criteria of significance, appropriateness, balance, feasibility, and budget described earlier, and 2) they did not duplicate some continuing program.

Programs are classified in the descriptions below by the R&D function they fulfill, rather than by the existing vs. new categories. That is, the proposed basic research program to add to the knowledge base on education, and the researcher training efforts to improve the country's R&D capability, are described first. The programs to improve educational practice within the current system are described next, followed by the programs to solve major problems.

Since both new and old programs are integrated in the agenda, it might help to identify where the existing programs are. (Figure 1 will clarify the following list.) Most existing activities are in research, researcher training, and improving practice. Some relate primarily to one goal, so they were placed within goal specific projects. Others, particularly from Regional Laboratories and Centers, seem to fall either within the learner goals or the system goals, yet do not cut across both areas. These are clustered appropriately and classified as specialty areas. Also among the continuing activities are two comprehensive programs that cut across all goals: the *Experimental Schools*, designed to improve educational practice, and the *Career Education Models*, designed to solve the problem of students graduating without attitudes and skills needed for careers. Finally, once suggestions for new comprehensive programs were identified, it was apparent that several continuing activities fit within the new areas.

The activities that relate to fewer goals and involve continuing programs are described only briefly, since they represent fewer NIE options in agenda design. The continuing comprehensive programs are described in more detail because of their complexity and importance to major problem-solving, and because their level of development allows a detailed discussion. By and large, the new comprehensive programs are not yet developed in enough detail to present a lengthy discussion. The one that is currently best developed, the Home-Based Early Education Program, is described in some detail. Others are described in a few paragraphs each, and outlines for each program are included for reference. When the Planning Unit is advised that any program warrants more detailed planning, work will continue, and progress reports will be presented before the end of the fiscal year.

A. Goal-specific Projects

The proposed goal-specific projects include an unsolicited basic research program, a small, directed intramural research program to accomplish the Institute's internally-identified research needs, and a few applied R&D projects in specific goal areas.

The current USOE unsolicited research program is heavily loaded in the cognitive development area; thus NIE is likely to change the balance of projects somewhat. The goal analysis in Chapter II of this paper indicated a stronger effort, particularly for the social-emotional goal and for the area of access. Opening these areas will require the involvement of researchers from other disciplines. Though the balance might be different, examples of current projects are still likely to by typical. Several of these are:

1. Cognitive Development: Relationship between perceptual development and acquisition of reading ability of 1st, 2nd, and 3rd grades.

2. Physical Development: Research related to the learning of children identified as having experienced malnutrition and heavy metal poisoning.

3. Social Development: Success-avoidant motivation and behavior; its developmental correlates and situational determinants.

4. Productivity: A study of the economic and social impact of differences in the quantity and finality of educational achievement.

5. Access: Biographical data as predictors of college grades of blacks and whites.

Two or three research suggestions appeared under several goals enough times in the total analysis to warrant their being proposed as directed research efforts. One of these projects involved a continuing survey of the public's attitudes toward education, demands for services, and willingness to provide resources. An initial statement on how that program might be developed is available. A second frequently suggested program involved the anthropological study of neighborhoods to identify factors that influence learning and learning motivation. A third frequently suggested program was in the area of access: an exploration of how NIE might facilitate acceptance of some program for fiscal equity. These types of studies would be logical for the intramural research program.

Finally, a number of applied R&D efforts are included in goal-specific projects. The Center for Urban Education's program to train citizens to participate in school advisory and decision-making functions, which is included under the participation goal, is an example of such a goal-specific project.

During fiscal 1972, approximately $12 million was spent on all categories of goal-specific research, and the same level is recommended for fiscal 1973. It is proposed that the small grants program, classified as goal-specific research in fiscal 1972, be placed within the Researcher Training Program during 1973. The funds for unsolicited basic research would actually be increased by that transfer, since an increase in the Researcher Training funds is anticipated to cover the additional program there.

B. Researcher Training

The primary purpose of the Researcher Training Program is to encourage and support quality training of educational researchers and research-related personnel. The program was originated to meet a need generated by the approximately thirty-fold increase in Cooperative Research funds over the past decade and the dramatic shift in emphasis from conventional research studies to large scale development, diffusion, and evaluation efforts. NIE will no doubt broaden the program to include techniques for research in problem-solving and to add support for education-related research training in other disciplines.

Specific objectives within the current Researcher Training Program include identifying the types of training most critically needed by educational R&D personnel, developing and testing materials to train them, and providing support for such operational training programs. The identification of personnel needs is being funded by the National Center for Educational Statistics (NCES), but directed by USOE's National Center for Educational Research and Development (NCERD). NIE, in assuming leadership, would want to continue this cooperative arrangement if possible. The materials development programs are being conducted, for the most part, through consortia efforts that will be examined closely during the coming fiscal year. As a part of this research agenda for NIE, the Planning Unit staff recommends that the personnel training effort be redirected to include apprenticeships on large R&D problem-solving efforts and internships within the Institute itself.

Finally, it is recommended that the small grants program be removed from the basic research area and included as a part of researcher training. About one hundred experienced researchers in various disciplines should be recruited from around the country to serve, with a small honorarium, as advisors for the students and novice researchers who receive grants. This should be a prestigious group, almost a club, who not only have the grantees as apprentices, but meet on occasion to hear results of the best grants, to advise NIE on researcher training, and to suggest promising candidates for internships and fellowships within the Institute itself.

Fiscal 1972 funding for Researcher Training was $3.2 million and, with the additional efforts, the proposed 1973 budget is $5.0 million.

C. Specialty Area Programs

1. Instructional Personnel

The purpose of this area is to increase the effectiveness of instructional personnel by conducting appropriate research, design, development, and testing of alternative training procedures. On-going programs in this area include much of the R&D activities at the Texas Research and Development Center for Teacher Education and the Stanford Center for Research and Development in Teaching. Stanford's research activities include R&D in heuristic teaching, bilingual competence for teachers, teaching in low income areas, and motivation under different instructional procedures. The Texas researchers are concerned with training teachers to gear instruction to personal needs of students. Other contractors are involved in R&D projects for adult literacy teachers, community college teachers, and training for teacher accountability.

As these projects are completed or phased out, it is recommended that this specialty area be discontinued, with later research projects being located in the goal-specific research area of personnel selection and training, and new development activities being placed within comprehensive programs. Fiscal 1972 funding for this area is approximately $3.0 million and recommended funding for fiscal 1973 is $2.0 million.

2. Curricular Programs

Activities within this area are directed toward the development and implementation of new curriculum systems, dealing with individualized instruction and instructional installation and management. The curricula serve preschool through adult target audiences, with the greatest concentration on elementary school children. The largest body of on-going work is supported through the Laboratory and Center programs. In addition, there are a few smaller curriculum development projects supported through the applied research program.

Examples of current curriculum development programs include:

a. The development of a comprehensive school mathematics program for students in grades 1-6 based upon instructional analysis by mathematics specialists and individualized according to the students' needs and abilities. (CEMREL)

b. The development of a program to provide a general education in aesthetics for K-12 students incorporating the exploration of light, sound, motion, time, space, the elements of the arts and the environment, and the creative experiences of people in the arts. (CEMREL)

c. Development of a comprehensive system for improving school practice, which includes instructional systems, training systems, installation systems, accountability systems, and modification systems. (SWRL)

d. Development of curriculum and instructional strategies for improving learning conditions in rural schools. (NWREL)

e. Development of a set of tested products which will enhance language and socio-cultural development of Spanish-speaking children in grades 1-3. (SWCEL)

As these projects are completed or phased out, it is recommended that the heavy emphasis of funding for curricular programs be shifted for better balance to other goal areas and into development efforts specifically related to comprehensive programs. As a step in this direction, several of the efforts now classified as curricular are being suggested for management within a comprehensive program area called Learner Controlled Instruction. Fiscal 1972 funding for Curricular programs is $10 million; fiscal 1973 projections are $9 million.

3. Theory and Knowledge for Organizational Change

Programs and projects within this area are directed toward the ultimate design of new organizational structures and processes and serve as the basis for the training of teachers and administrators in such change. Studies are concerned with elements of classroom organization, teacher behavior and school administration. Research related to students and organizational change includes grouping, reward systems, cooperation and competition, decision-making and governance, and characteristics of peer groups. Research related to teaching and organizational change includes differentiated staffing patterns and various teaching strategies.

On-going programs in the area are primarily supported through the Regional Laboratories and R&D centers. The programs include:

a. Studies of how school organization affects teachers and learners (Stanford);

b. Studies of new institutional forms of higher education (Berkeley);

c. Studies of decision-making structures for school districts and their influence on schools (Oregon);

d. Research and Development on academic games and studies of the social organization of schools (Johns Hopkins).

Fiscal 1972 funding for theory and knowledge for organizational change is $3 million. Projections for fiscal 1973 are $3 million.

4. Planning, Management, and Evaluation Technologies

All programs within this cluster are designed to increase the capabilities of schools in planning, management, and evaluation, and to train administrators in the use of a systems approach in these areas. Planning involves selection, analysis, and presentation of data needed for educational decisions and action; evaluation provides feedback to instructional managers and planners about the effectiveness of educational activities; and management involves the selection of goals and programs, the implementation of programs, and the revision of programs as necessary to meet goals.

On-going programs in this area include the educational cooperatives pioneered by the Appalachia Educational Laboratory, studies at the UCLA Center for the Study of Evaluation, programs on educational management at WICHE's National Center for Higher Education Management Systems (NCHEMS), the Administering for Change Program at the Philadelphia Laboratory, and much of the work at the Oregon Center for the Advanced Study of Educational Administration. In addition, the Far West Laboratory is developing a series of management training units of particular use to administrators and the Northwest Laboratory is already under way on the development of data management systems.

The purpose of most of these current programs is to develop tools and procedures that have general utility. As these efforts are completed, the released funds should be used for R&D in the same areas of planning, management, and evaluation, but geared to the specific needs of comprehensive programs. By that time, the comprehensive programs will be ready for this level of R&D effort, and in many cases the same agencies will be the performers. Budgeting and management, however, will be done through a directed program task force. Fiscal 1972 funding for this area is approximately $8

million, and the proposed fiscal 1973 funding is $7 million.

D. Comprehensive Programs

1. Experimental Schools*

Although a number of sources of funds are available to conduct educational R&D and to develop pilot or model projects, there are almost no funds to support the extensions of research needed to build the bridges between basic research and common educational practice, or between the clinical testing of an educational theory and its natural application in a real-world setting. In recognition of this lag between completion of research and development and any widespread operationalizing of its ideas and procedures, a limited number of large-scale comprehensive experiments, emphasizing new patterns of financial support, staffing, training, organization, and community participation are being funded through the Experimental Schools Program.

The Experimental Schools Program, introduced in March 1970 by President Nixon in his Message on Educational Reform, is designed to test the hypothesis that widespread adoption of effective educational innovations can be facilitated through school experimentation emphasizing comprehensive reform and the development of alternative educational practices. The Experimental Schools Program has several special features which will be described below.

a. Comprehensiveness. An Experimental School project must be Comprehensive** in that it includes at least the following:

1) Project goals specified in terms of the type and purpose of learning experience to be provided;

2) A plan for broad participation in the design, implementation and operation of the project, including a viable relationship with the community;

3) A coherent, integrated, mutually reinforcing set of "operational variables" including, but not limited to: the nature and substance of the curriculum; the nature, role and organization of staff and necessary staff training; the use of time and space, including possible variations in the length of the school day, school year, or number of years required of participants in the project; an administrative and organizational structure consistent with and supportive of the program; an evaluation design and a strategy for its implementation.

An Experimental School project must include a comprehensive educational program for 2,000 to 5,000 children in kindergarten through 12th grade. The lower limit (2,000) represents the minimum number of students necessary in a comprehensive K-12 program for effective evaluation, and the approximate upper limit (5,000) represents the maximum size of a project which can be considered, given the projected appropriations for the Experimental Schools program.

Those eligible to participate in the Experimental Schools Program, authorized by the Cooperative Research Act (Public Law 83-531, as amended, and regulations issued pursuant to it), are public (including State and local education agencies) or private, profit or nonprofit agencies, institutions, or organizations, as well as colleges or universities. Applications are encouraged from the widest possible variety of agencies, institutions, or organizations, including those which would be created specifically for the purpose of operating an Experimental School Project. Those organizations which are not currently operating schools may find it advantageous to form a cooperative relationship with established educational agencies. In the case of an organization which has submitted an exceptionally promising program design, but which has not yet been able to secure support for basic per-pupil expenditures (see the section on Incremental support), a planning grant may be awarded to permit the more thorough development of the program design and to provide time for securing the necessary operating costs.

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* This section was prepared by William Rabinowitz using materials from a tentative program prepared by the Experimental Schools Program, USOE.

** The term "comprehensive" has acquired a specific connotation among educators referring to the breadth of the curriculum, e.g., the Comprehensive High School. The term is used here in its broader and less technical sense meaning "accounting for or comprehending all or virtually all pertinent considerations;" for example, including at a minimum all the significant elements of a formal educational program.

b. Planning, Development, and Operations. The Experimental Schools Program recognizes that planning, development, and operation of a project are overlapping activities. The terms as used here refer to stages of Federal support rather than stages of project development. Preparation of formal proposals often results in an inequitable competitive situation among applicants with different resources. The Experimental Schools Program, therefore, initially requests letters of interest. Upon receipt of such letters, a selection committee designates those few who should receive planning grants to permit more thorough planning of their total program design. The planning period is usually approximately 60 to 120 days. A final competition based on complete detailed proposals from those applicants receiving planning grants occurs subsequently. Those applicants selected to operate Experimental School projects receive support for five years of operation. Operational grants normally are made for 30 months with a continuation grant providing support for the final 30 months awarded following a program review. The program of each Experimental School project must be implemented in the first year of operation rather than in stages over the five years.

c. Incremental Support. In terms of the five years of operation of each Experimental School project, financial support is limited to incremental costs associated with the implementation of the program, such as the development of staff necessary for the operation of the program, the development of materials, minor remodeling, and evaluation and documentation of the project. The Experimental Schools Program cannot support the basic per-pupil expenditure which provides for the operational costs of the project, and it cannot support major construction. Each applicant organization must indicate its commitment to provide operating costs for the full five years of operation of the Experimental School project. The eventual cost of operating an Experimental School project after the anticipated development work is completed must be kept within the limits of available resources so that the program could be continued after the five years of Federal support have ended.

d. Experimental School Site. There are no geographic restrictions on the location of the target population. Students in a single Experimental School project may be located in a number of buildings, cities, counties, school districts, or states. Rural school districts, with student populations of less than 2,000, are encouraged to form clusters. Such clusters might attempt to provide solutions to a common, or set of common, significant educational problems. There is no requirement that each agency or organization in the cluster must have an identical program, as long as the project provides a continuous K-12 program for the target population.

e. Target Population. The Experimental Schools Program assigns a high priority to projects which focus primarily on students who are not experiencing educational success and who come from families of low income. Two points merit clarification:

1) The term "families of low income" is not restricted to the Office of Economic Opportunity or Title I (ESEA) definitions of poverty level. The Experimental Schools Program considers any reasonable definition of low income for the geographical area(s) in which the proposed project is to be located. However, the definition must be specified and a rationale provided.

2) The phrase "focus primarily on students who are not experiencing educational success and who come from families of low income" does not mean that projects must be limited exclusively to such students.

f. Evaluation and Documentation. Evaluation and documentation is a major focus of each Experimental Schools project. Personnel at each specific project are responsible for documentation, for the kind of formative evaluation needed to modify and improve the project, and for an assessment of the outcomes of the project in terms of its particular goals and objectives. Evaluation on a second level—summative in nature—is also specific to each project, but it is the responsibility of an evaluation contractor who is not part of the project staff. A third level of evaluation includes an omnibus evaluator whose activities take in all projects and whose concerns include replicability of practices and programs, assessment of the second level evaluation activities, and the success of the Experimental Schools Program as a whole.

Given the small size of the Experimental Schools Program and the high level of interest in the design and implementation of significant, comprehensive,

alternative educational programs, it is reasonable to assume that a number of agencies, organizations, institutions, or school systems will develop the means to implement experiments without assistance from the Experimental Schools Program. In order to support and encourage these comprehensive experiments, the Program will consider requests from such applicants for participation in the evaluation and documentation of their projects.

g. History of the Experimental Schools Program. When S. P. Marland, Jr., was appointed U.S. Commissioner of Education on December 17, 1970, he announced that rapid implementation of the Experimental Schools Program was one of his highest priorities. On December 28, 1970, some 20,000 copies of the first announcement regarding this new program were distributed nationwide.

The announcement set forth the general policies established specifically for governing the first projects, and it solicited letters of interest from all agencies interested and able to combine into a single, comprehensive, kindergarten-through-grade-12 project a wide variety of promising practices for 2,000 to 5,000 predominantly low-income family children.

By February 1, 1971, nearly 500 letters of interest had been sent to the Experimental Schools office. An independent selection committee recommended eight sites which, in its judgment, had put together the most creative and most significant combinations of promising practices that could be operational in September, 1971. Each of the eight sites was given a 60-day planning grant to work out comprehensive programs meeting all the requirements laid out in the first announcement. The eight agencies which received the $10,000 planning grants were:

Austin, Texas, Independent School District
Berkeley, California, Unified School District
Ferguson-Florissant, Missouri, School District
Franklin Pierce, Washington, School District
McComb, Mississippi, Public Schools
Minneapolis, Minnesota, Public Schools
Rochester, New York, City School District

A panel reviewed the eight proposals and on April 10, 1971, recommended three to be Experimental School sites: Berkeley Unified School District; Franklin Pierce School District; and the Minneapolis Public Schools.

Each of these sites developed its own unique program, each met the Experimental Schools requirements in ways which suit the particular needs of the communities involved, and each combined a variety of promising practices into a comprehensive K-12 school design. The plans are complex. They encourage flexibility. They allow for change and adaptability as progress reports and interim results show the need for changes in direction or emphasis.

Recognizing the need for long-term assessment, each Experimental School site is funded for five years of operation; first for 30 months to be followed by additional funding for the final 30 months. Thirty-month operational grants in the following amounts have been awarded to:

Berkeley.....$3,639,063
Franklin Pierce.....2,462,718
Minneapolis.....3,580,877

The Berkeley, Franklin Pierce, and Minneapolis projects should not be viewed as models. Each was developed out of the experience, the history, and the special characteristics of a particular site at a particular time—the spring of 1971.

Each of the three projects combines a diversity of promising practices derived from research, demonstration, and experimentation in a comprehensive educational program. Some of the most promising of these practices are:

"Patterns in Arithmetic" (a media/programmed approach to individualized math instruction) developed by the Northwest Regional Educational Laboratory.

Bilingual materials developed under a Title VII, Elementary and Secondary Education Act (ESEA) grant to Tucson, Arizona, Public Schools.

"Man, A Course of Study" developed by a National Science Foundation award to Educational Development Corporation.

"Collaborative Problem Solving" developed under an Education Professions Development Act (EPDA) grant.

"Individually Prescribed Instruction" developed by the Learning Research and Development Center and Research for Better Schools in Philadelphia, Pennsylvania.

"Work Opportunity Centers" developed by OE's Bureau of Adult, Vocational, and Technical Education.

"Environmental Science Center" developed under Title III, ESEA.

The Charette (an organizational technique) developed by OE's former Office of Construction Services.

"Child Development Center" developed by OE's Follow Through Program.

"Pyramid Reading Program" developed by the University of Minnesota under a Title III (ESEA) grant.

These practices illustrate the movement of ideas developed by federally supported research programs into wider practice.

Because of the complexity of their programs and because of their ambitious goals, any one or all three of the 1971 Experimental Schools sites may fail to achieve success. But regardless of the degree of achievement overall—or for any of the components—the three sites represent nationally significant comprehensive educational experiments. Together these first three, and those to come, promise to give a test to the idea of combining several promising practices into a comprehensive, coherent, articulated educational program.

h. The Future of the Experimental School Program. The Experimental Schools Program expects to have a limited number of new starts in each of the next five years. During the life of the program a wide variety of comprehensive experiments will be supported. Thus the requirements, procedures, format, and criteria used to select Experimental School sites will change from year to year.

Experimental Schools is designed as an evolving program in order to encompass the newest educational ideas as well as to avoid the administrative rigidity and program inflexibility that seems to accompany the creation of new units. Although it is designed as a terminal program, it is constantly revising and reviewing its annual focus. In the fast start accomplished in fiscal 1971, two competitions were necessary: the first, for projects to be operational in September 1971, and the second, for projects to receive sufficient planning and development time to be ready for operation in September 1972.

Thus, on March 31, 1971, a second competition was announced by the Experimental Schools office. The second competition broadened the Experimental Schools Program by soliciting proposals for comprehensive projects which represent significant alternatives to existing school organization, practice, and traditional performance. Applicants were asked to shift their focus and look anew at what students ought to learn and how to make different use of time and space, to rethink staffing patterns and personnel requirements, to consider alternative ways to organize and administer the schools, and to include the community in active participation in educational decisions. The second announcement was sent out nationwide and more than 300 letters of interest were submitted. An independent selection committee chose the following to receive $30,000-$40,000 four-month planning grants to prepare a complete proposal:

Chicago Public School Dist. No. 299, Illinois
City School District of New Rochelle, New York
Edgewood Independent School District, San Antonio, Texas
Federation of Independent Community Schools, Milwaukee, Wisconsin
Newark Public Schools, New Jersey
School City of Gary, Indiana
School District of Greenville County, Greenville, South Carolina
University of North Dakota, Grand Forks
Vermont State Department of Education, Montpelier

Similar planning grants were awarded to two additional sites in April 1971. On the selection committee's recommendation, Portland Public Schools,

Oregon, was given an award to continue development of its proposal. The National Urban League, New York, New York, was awarded a grant to develop a proposal based on the "street academy" concept. They were included in the second competition with those listed above.

In December 1971, after a review of all proposals by an independent panel, three sites (Greenville, San Antonio and Newark) were designated for large scale programs to become operational in September 1972, subject to the successful completion and negotiation of a final plan. The Piedmont Experimental Schools (Greenville) and the Edgewood School District (San Antonio) have negotiated contracts and national competition is presently in effect to seek the most qualified bidder to evaluate both these projects.

In a special category, 12-month grants were awarded on July 1, 1971, to five applicants whose letters of interest presented a uniquely promising component which, when further developed, could later become a significant part of a comprehensive program. The one-year grant winners were:

School District No. 9, Browning, Montana
Seaford School District, Seaford, Delaware
Davis County Community School District, Bloomfield, Iowa
West Las Vegas and Las Vegas City School Districts, Las Vegas, New Mexico
Green County Board of Education, Eutaw, Alabama

In fiscal 1971 and 1972, Experimental Schools awards were limited almost exclusively to existing K-12 public school agencies. These were deemed most capable of implementing comprehensive projects that incorporated the best of promising practices in a creative educational design. From the outset, the planners of the Experimental Schools Program resolved to interpret the word "schools" broadly to include all of education. Thus, future comprehensive projects will be developed to take into consideration such relationships as early childhood education and its linkage to K-12 programming, postsecondary school education and its linkage to K-12 programming, community-based education which may encompass all ages in a given community, higher education and its extension, as well as new forms of education designed to improve and reform the present practices.

i. Summary of 1973 Budget Request (in millions)

Continuations (second 30-month awards) of fiscal 1971 initiatives (includes evaluation & documentation) for 3 projects	$11.2
Continuations (30-month operational awards) for 3 projects planned and developed in fiscal 1972 (includes evaluation & documentation) for each project	15.7
New Starts in fiscal 1973 for 5 projects; planning and development	3.1
Total Projects: 13	Total Cost: $30.0

j. Conclusion. The Experimental Schools Program itself is experimental—it is testing significant alternatives to present practices in pedagogy and government support for educational R&D. Most notably:

1) Funding is for something longer than a year, allowing for continuity and internal integrity while testing and retesting possible alternatives;

2) The target population is large enough to allow for sufficient experimentation but small enough to be thoroughly evaluated and documented;

3) The choice of curriculum, organization, staffing patterns, and internal evaluation measures are all the choice of local personnel and the community;

4) Each applicant is required initially to send a letter of interest rather than a professionally prepared proposal;

5) Once a letter of interest is chosen

by an independent selection committee as a possible contender for an operational grant, a planning grant to allow for any necessary technical assistance is provided;

6) Instead of the evaluation and documentation coming after a project has been completed or well under way, it is an integral part of each Experimental School site from the beginning.

7) Documentation includes not only the narrow components in a project, but the project itself and the total environment of which it is a part and which it is shaping;

8) The independent evaluators will use anthropological and sociological measures to identify both what is appearing to succeed and what is appearing to fail, sharing both the "hard" and "soft" data with the Experimental Schools office and the local project staff;

9) The three levels of evaluation ensure completeness and integrity in the reporting system; and

10) Each site will provide an information center for visitors which will not impinge on the experiment itself yet will fully inform all interested parties on the results of the experiment.

2. Career Education

The purpose of career education is to help students acquire the competencies and attitudes necessary for choosing, obtaining, and successfully performing a series of satisfying and self-fulfilling careers during the course of their lifetime. The ability to achieve this goal probably depends on such variables as: 1) the variety of career experiences one has had, 2) the availability of authentic career role models, 3) access to accurate career information, and 4) the possibility of a recurrent cycle of education and employment.

Although popular rhetoric in the professional literature has extolled the importance of these variables, very little systematic research has been conducted on them and schools and colleges do not, in practice, provide much in the way of career experience, career role models, career information, or opportunity for education reentry. Indeed, schools and colleges have become isolated from the mainstream world of employment and appear to serve more a custodial than an assimilation function.

a. Variety of career experience. The dominant motivation in the history of support for vocational education has been the need to prepare people for employment. In times of manpower shortage, industries provide on-the-job training. When there is competition for jobs, employers depend more on schools and colleges for this function. Thus the economic policies of the federal government may have more to do with unemployment and with the status of vocational education than either has to do with each other. A recent evaluation of vocational education estimated that all federally-funded manpower training programs combined have reduced unemployment by only .5% (Teeples, in press).

Nevertheless, schools and colleges have a legitimate role in preparing students for employment, even though employment depends on the availability of jobs, a variable that is beyond the purview of education. There are other requirements for successful employment. Acquiring a job depends on knowing what jobs are available, on having appropriate credentials and acquisition skills, and on placement assistance. Once a job is obtained, successful performance depends on a host of attitudes and skills, e.g., communication skills, technical skills, decision-making ability, problem-solving ability, dependability, job acceptance, etc. Even if such skills weren't prerequisite to job success, they would be important educational goals on their own merit in providing students with a sense of competence and of being in command of their lives, a range of avocational options, and increased adaptability to change.

The programs considered most successful in providing these competencies have reported extensive use of a wide variety of work experiences. These work experiences must be legitimate employment opportunities and not simply game playing. Students must realize actual consequences of their performance, enjoying the rewards and suffering the penalties; their endeavors must have impact on significant others. Such work experiences should take a wide range of different forms: an activity that simply occupies a person's time, a lifework by which a person earns a living such as a trade or profession, an avocation with its intrinsic benefits, a

community service project, a social problem-solving effort, etc. The purpose of these experiences is to give students a sense of what a particular occupational life style involves. The goal is not to impart specific occupational skills so much as the generalized coping behavior and attitudes necessary in the world of employment. A wide range of employment experiences doesn't merely adjust the student to the world of employment–it should also teach the student what things are wrong and in need of reform. The student who has had a range of work experiences will be better able to compare the available choices of career opportunities and is likely to make better career decisions. He is also likely to be less intimidated by the bureaucratic environment, having become familiar with it in a variety of forms over a long period. As a result of early experience with bureaucracy, the student may feel some ownership of that environment, have better "purchase" on it, and hence feel less constrained about changing it. It is also possible that varied career experiences, interleaved with and related to educational programs, will blur the distinctions between school, work and avocation, and will ease the transition from school to employment.

Federal legislation provides a number of authorizations for the support of current programs that provide work experience and occupational skills training. These programs are administered by a variety of bureaus in HEW, DOL, OEO, HUD, and include such things as: Bureau of Apprenticeship and Training (DOL), Neighborhood Youth Corps (DOL), Public Service Careers (DOL), Work Incentive Program (Federal-State Employment Service Offices), Youth Opportunity Centers (Federal-State Employment Service Offices), Job Corps (DOL), Manpower Development Training Act (DOL, USOE, Federal-State Employment Service), Concentrated Employment Program (OEO), Vocational Education Act Programs (USOE), and Elementary and Secondary Education Act Programs (USOE). These programs are largely remedial rather than preventive in nature. They represent the attitude in government that manpower training programs can help overcome the structural barriers and rigidities which impede efforts to achieve maximum employment. Unfortunately it is very difficult to separate the outcomes of manpower training programs from the manpower effects of government policy in fields such as national defense, trade policy, natural resource development, and expansion of public services.

Evaluations of such programs typically reveal that completion rates and relevance to labor market requirements could be improved by additional investment but that perhaps greater returns can be obtained from efforts to increase the demand for labor (Mentec Corporation, 1971). There is some evidence that *early* introduction of children to employment experiences results in subsequent income advantages (Hilton, 1971, p. 104). There is also some evidence that secondary school employment experiences are associated with improved prospects for employment on leaving school (Department of Labor, 1971, Vol. 2, p. 19). However, a national survey by Eninger (*Vocational Education*, 1968, p. 39) found that the majority of graduates of occupational training programs did not enter the trade for which they were trained. It appears that "success" is not related so much to specific skill preparation as to academic level or certification. Very few jobs require specific vocational training. Most production methods are taught on the job.

Although cooperative work-study programs are viewed as one of the more successful vocational education innovations, there is some evidence that they are not significantly more effective than academic programs in producing social adjustment or adult competence in adapting to work, though some students do benefit much more from such programs (Ahlstrom and Havighurst, 1971). In general, research on work-experience programs in schools has yielded equivocal results due to poorly defined treatment conditions and to masking effects among different target populations that respond in opposite ways to treatment. However, there have been some notable exceptions. The Department of Defense, for example, has conducted extensive research on work-study experience and has had considerable success in developing effective on-the-job training procedures. One particularly interesting study by the Human Resources Research Organization demonstrated dramatic economies in learning time when peers or "buddies" provided on-the-job instruction. Other research suggests that career development of inner-city students is accelerated by structured vocationally related activities (Vriend, 1969).

Studies attempting to assess the effectiveness of work experience will probably continue to yield equivocal results until the treatment conditions are more precisely defined and controlled. Work-study is an umbrella term that covers a host of treatment conditions

that may mask each other in the global evaluations that are common to this field. More analytic experimentation is needed on the component dimensions of work experience using multiple dependent variables to determine the kind of work experience that is most effective for achieving different outcomes by various target populations.

A memorandum from the Educational Policy Research Center at Syracuse University describes three target populations which cut across traditional categories, such as age, IQ, and socio-economic status, that may respond quite differently to career development programs, Makers, Non-Makers, and Post-Makers (Green, 1971). Makers are imbued with the puritan ethic, work hard, get good grades and a comfortable and secure job at the end of the education pipeline. The Non-Makers either see themselves failing in the schools or see the schools failing them; they want to succeed and accept the role of the school in assisting them in "making it," but the schools are not helping them. The Post-Makers have the ability to "make it," but choose not to. It is possible that entirely different kinds of treatment are required by these groups and research is needed to explore such interactions. For example, perhaps the effect of labor market discrimination on the motivation and self concept of the Non-Maker nullifies even the most carefully engineered school program while the Post-Maker may suffer from an opposite affliction, an excess of affluence and security; a placement program that guarantees a well paying job may be an effective incentive for the Non-Maker and have a negative impact on the Post-Maker. A global assessment of a program that included both Non-Makers and Post-Makers would yield results for these groups that masked one another and, consequently, no significant positive or negative overall effect would be observed.

While a substantial amount of data has been compiled by the Commission on Human Resources and Advanced Education (Folger, *et al*, 1970) on the career development activity of colleges and universities, the cost effectiveness of different patterns of post-secondary education has not been explored. Supply and Demand Studies need to be related to alternative patterns for leaving school. Experimentation with early exit may yield higher economic return than the present pattern of prolonged schooling.

Colleges and universities have not experimented with work experience as an effective career development activity but recent development of "open university" programs, such as the Empire State College and the University Without Walls, allow students to obtain degrees by examination and give credit for learning on the job and in other life experiences. Such programs promise to improve career education at the post-secondary level and should be systematically evaluated.

Similar programs have been tried at the secondary school level. The Parkway program in Philadelphia, the Metro program in Chicago, and the Satellite Academies in New York City use the entire community as a classroom—hospitals, stock exchange firms, insurance companies, churches, the police department and many other public and private institutions. Almost completely individualized programs are possible, and the potential exists to develop school-work programs in almost any occupation. These programs also need to be carefully evaluated. Too often enthusiasm and faddism substitute for empirical data attesting to the soundness of such programs.

Hypothesis: If all students are exposed to a wide variety of career experiences (sampling a broad spectrum of career possibilities) they will make more informed career choices and will be better prepared for employment.

The statements of the benefits of varied work experience above are of course hypotheses that can only be tested by providing students with a range of employment experiences from the very beginning of their education. But the students graduating from schools today have not been exposed to such experiences. The schools have become isolated from the mainstream world of employment; the substance of the curriculum in most schools is not job-relevant; and the teachers themselves have had limited exposure to the world of employment.

To integrate schools with society, it will be necessary to break open our economic institutions, from large bureaucratic corporations to local post offices and real estate agencies, and give them a share in the learning dollar in return for an explicit role in education. This might best be done by giving all students an entitlement of a certain sum which could be redeemed by employers and other organizations which provide educational services. The young would be assimilated into the economic activities of adult society from an early age and adults could cash in their education entitlement at recurring periods throughout their lives whenever it is most needed for retraining.

Whatever method is used to test the career experience hypothesis, it is clearly a long range R&D effort that will not yield quick answers and should avoid the tendency, characteristic of past research in the field, to conduct global evaluations of undefined treatments that have not yet been developed to the point where stable and predictable results can be obtained. The following section describes some possible lines of research and development for NIE that will help test the career experience hypothesis.

Promising current R&D in Career Education includes the Employer's Model (Model II) for career education (Morrison, 1971) presently being funded by the USOE which should be continued by NIE. Early results with the attempts at organizing consortia of employers to provide career education opportunities to secondary students promises to develop into an effective alternative system of providing career education. The Satellite Academies in New York City are already operating and the program is being evaluated by the Center for Urban Education. Model II provides a vehicle for testing the above hypothesis and should be supported.

Possible new research activities for NIE include three areas. One is research on the effects of heterogeneity or variability of work experience obtained by a student. Is it better to provide short periods of experience in a wide range of different careers, or longer periods of experience with a small sample of careers?

A second area of research is on the effects of structuring the sequence of work experiences. Is a progression of career experiences, carefully graded in difficulty so that development of coping skills prerequisite to more advanced opportunities will appear early in the sequence, prior to the point where they will be needed, more effective than a more random sequence? Perhaps common assumptions about starting with simulated work experience then moving to ever more demanding tasks isn't necessary and merely adds to educational costs.

The third research area is on the effects of the nature of the work situation. What kinds of work experience are most helpful in inculcating appropriate attitudes and generalized coping skills in the student? Examine such variables as: amount of pressure or tension; amount of decision-making involved; personality characteristics of one's fellow workers; extent of prerequisite knowledge required on the job; and work setting.

Dependent variables in such research projects will, of course, depend on the treatments being considered and the nature of the target students, but career development objectives that are suitable candidates include: coping, planning, communication, problem-solving and decision-making skills; acquisition and retention of employment; and job satisfaction measures.

Four areas of development are available for NIE. First, NIE can support the design and development of alternative ways of providing work experience in schools and post-secondary institutions, e.g., simulations of career situations in the school, school-run industries, etc. Second, NIE can support analyses of obstacles to installation of new R&D models and design of proposed solutions for overcoming these obstacles. Such analyses may include logistics studies, e.g., the feasibility of integrating students into employment settings; entry and exit problems; termination and admission procedures; length of participation time; management studies; staffing, etc. Economic problems need analysis, such as cost effectiveness studies; payment systems for student workers; school finance issues related to allocation of resources to non-school agents to assist in programs. Legal and political problems need analysis, such as credit transferability, accreditation, teacher certification, minimum wage, health and safety insurance, child labor laws, trade entrance, apprenticeship credits, labor management relationships.

Third, a comparison of cost-effectiveness of alternative career development programs is needed, followed by the selection of the most promising alternatives for R&D investment. Finally, proposed new career development programs need experimental, small-scale trial and revision, with projections for later wide-scale implementation of those programs that are successfully developed. Implementation plans must include employer, student, and community involvement, and manipulation of incentives, information, and laws necessary to the maintenance of successful program operation beyond the R&D period.

b. Authentic career role models. Most teachers have only been students before teaching. They haven't been employed in other roles, e.g., manager, plumber, accountant, lawyer, realtor, businessman, etc.

Students lack effective role models: adults who do math, who manage companies. They are isolated from experts. Students must have more opportunity to interact with men and women from a wide range of careers if they are to learn to appreciate the dignity of many different kinds of work. Dignity comes from an understanding of and association with people in a particular occupation–it isn't sufficient to merely read about what lawyers, architects and salesmen do. Contact with a broad range of career models will help students avoid the narrowing restrictions on their career aspirations. This may be especially important in the case of female students. For example, contact with women career models has been highly constrained to the "female" occupations: nurse, teacher, housekeeper. Few female accountants, engineers, or business executives are found among the ranks of elementary school teachers.

One way to diversify learning experiences for students is to insure that they will receive help from a wider range of people. At present, parents, citizens, trade and professional people have too few opportunities to be involved with students. One obstacle to re-integrating students with such people is the protective certification laws which presently select a very narrow pipeline of teachers with limited experience outside formal schooling. In contrast to the general population, teachers represent a relatively homogeneous group. Much of the sameness in American education can be attributed to the standard credentialing procedures that are being used. Of course there are some positive steps being taken to alleviate this problem. In some school districts, trade and industrial teachers are not required to have college degrees (Smoker, 1971) but must have several years of work experience. Wisconsin has become the first state in the nation to certify counselors without requiring that they have a teaching background. They do not, however, require a range of alternative career experience as a prerequisite to employment. Use of paraprofessional aides is also a step in the right direction, but these aides are largely housewives and don't represent the range of career roles in the community.

Those who object to more flexible certification laws point out the possible decline in teaching effectiveness if schools are opened to hordes of untrained practitioners from assorted trades and professions. Those objections are amplified by the current surplus of school teachers in this country. However, research evidence indicates that professional teacher training doesn't add significantly to teaching competency when measured by student achievement gains. Experienced teachers do not perform better than tradesmen and college students who have never taught (Popham, 1971).

Hypothesis: Given a wide range of authentic career role models, students will more readily acquire desired job attitudes and competencies.

Despite the compelling rationale for increasing the diversity of those who teach there is a lack of research evidence to justify this trend. No one has conducted a systematic investigation to determine whether increased staff diversity results in a greater range of learning experiences for children or in more effective growth in students. The approach for an NIE program should emphasize not only the mechanism for increasing staff diversity but this work should be based on empirical evidence that such variability has a significant impact on students. Once evidence is obtained to support specific modifications in personnel certification practices, it will be necessary to explore alternative ways to obtain changes in state certification laws. Pilot projects will also be necessary to develop new methods for recruiting a greater range of talent into education. The reform of certification laws will require the development of new measures by which teachers might be certified. This is a substantial project in itself. Another stage in this program to provide a variety of career role models is a project designed to modify the incentive conditions so that staff diversity once obtained will be sustained. For example, there is some evidence that the allocation of salary levels to staff members does not reward those people who are most effective. In fact, staff members who are most effective may be selected out of the system after a short period due to competing opportunities from more attractive, better paying jobs with greater recognition and more challenge. Teacher survival rates are quite low; only half of those people who enter teacher training actually go on to teach and after three years only fifteen percent of those who went into teaching remain.

Research is needed in five major areas here. First, longitudinal studies are needed to better understand why people decide to enter teaching in contrast to other fields. If we are to attract a broader range of people into teaching, it will be necessary to study the factors that govern movement of people in and out of teaching careers. Second, we need to explore the literature for incentive systems that have been tried and found successful in recruiting, selecting and rewarding people with a wide variety of career backgrounds to enter and

stay in teaching. Replicate successful models and disseminate the results to school boards. Third, trade-off studies should be conducted to determine how much it costs to prepare new teachers as compared to selecting, on the basis of teaching performance measures, persons from trade or professional groups who are already competent and then recruiting them into teaching.

Fourth, we need to study the effects of making teacher education more relevant to career education, e.g., using people from other professions as teacher trainers, modifying teacher training curricula, requiring career experience as a prerequisite for admission to teacher training, etc.

Finally, we need historical studies of the ways in which certification laws and credentialing practices have been changed over the years.

Several areas of development are possible here. We can develop selection tests to measure the competence of adults in teaching career objectives. Student achievement and student acceptance might be among the criteria for such measures. Then, using these selection measures, we can experiment with alternative recruitment procedures for inducing a select sample of non-certificated practitioners from a diverse set of career fields to enter teaching at a number of experimental school settings, e.g., retired professionals and tradesmen might serve short-term appointments as teacher interns while completing certification requirements. The effects of increasing staff diversity in these pilot experiments would then need evaluation. If the evaluation yields positive results, we can design plans for developing competency-based teacher certification demonstrations in several locations to show how school districts can obtain a wider range of career role models. At the college level, experimental programs might be developed to assess the effects of providing added compensation or promotions to faculty on evidence of working experience outside the university, in government, industry, agriculture, etc.

c. Access to accurate career information. Counseling, guidance, and curriculum specialists agree that giving students abundant information about their own abilities and desires in addition to accurate information about employment opportunities and associated requirements, contributes to better career choices and more efficient resource allocation (*Vocational Education*, 1968, p. 5). Although this belief may be more a professional creed than fact, there is some evidence that increased labor market information improves the efficiency of job search (Department of Labor, 1971, vol. 3, p. 65).

For a variety of reasons, despite the supportive data and general agreement about its importance, the quality and amount of career information and supportive services for decision making is inadequate. Information is often too general, refers to job opportunities that are not available to the student, and does not include such mundane matters as filling out job applications, how to conduct interviews, or how to assess current wages versus deferred benefits (Ginzbert, 1972).

Two major sources of career information are: curriculum materials, and guidance and counseling services. Federal funds from the Vocational Education Act are currently being used to develop sets of instructional materials on subjects related to occupational clusters. Materials typically provide occupational information about the world of work for grades K-6, occupational orientation and exploration for grades 7-9, and career preparation from grades 10 through post-secondary. Much of this material has focused on the emerging occupations such as Nuclear Medicine, Environmental Technology, and Chemical (alcohol and drug) Dependency Counseling. Additional support has been given to the Northwest Regional Laboratory for the reclamation for school use of instructional materials originally prepared by the Department of Defense that cover a wide range of technical occupations.

Most of these curriculum development efforts make very little use of careful evaluation-revision cycles. Editorial judgment is the primary means for insuring the quality of the material—empirical data on performance of students using the material is only collected on large blocks or units and consequently such material is not finely tuned.

Guidance and counseling services are now widely available. Unfortunately, most counselors have been academically trained, have no firsthand experience with the many careers that students need to know about, and are spread too thinly to be able to offer more than token help to students (Grant, 1970). Nevertheless, a variety of new ideas are being tried to improve the quality and amount of career information available to students.

Elementary schools in Hackensack, New Jersey, for example, operate school industries, e.g., painted neckties, rubber stamps, etc., as a vehicle for learning about different careers. Many junior high schools use simulated careers in the form of games to provide career information. Georgia has a program of education and career exploration that gives students a chance to sample how it "feels" to be a jail matron, counselor, bank teller, chiropractor, disc jockey, egg packer, etc. At the high school level some districts are providing counselors with paraprofessional assistance, using mobile career counseling vans, computer-assisted guidance systems, and Project VIEW materials featuring career information on microfiche mounted in data processing aperture cards. Some school districts are going the next step and providing placement and follow-up services. These districts sometimes use special computer files of available job vacancies for referral purposes (Smoker, 1971, p. 53).

Hypothesis: If students receive abundant information about career cultures in addition to accurate information about their own abilities and desires, they will make more informed career choices.

Recent analyses of 5-year follow-up data on over 140,000 students indicated that, despite all efforts at providing career information in the schools, choices are made illogically, ignoring the labor market, aptitudes, and any other information that ought reasonably to have influenced the decisions. Counselors were especially unable to help lower socio-economic status students. The analyses indicate that much more is needed by students in decision making (Flanagan, *et al*, 1970).

One of the more flagrant failures in providing career information involves the discriminatory counseling of women against entering jobs that have traditionally been dominated by men. Though women are now 38% of the labor force, half of all working women are in 21 out of the 250 occupations identified by the Census Bureau. One-fourth of women workers are in 5 categories, all relatively low paying: secretarial, waitress, domestic, bookkeeping, and elementary school teaching.

The USOE has recently funded a school-based career education model (Model I), being developed in six school districts, that is attempting to pull together career-oriented curriculum segments that have been developed previously, fill gaps with new material and evaluate the entire sequence. This work, being coordinated by the Center for Vocational and Technical Education at Ohio State University, is an ambitious effort that is attempting to infuse the total school curriculum at all levels with information about the culture and life style of careers in the world of work.

The USEO also supports the development of a home-based career education model (Model III) that provides career information directly to the home via television. A residential model (Model IV) provides career education for entire families in a rural setting especially adapted to the needs of poor people. All three of these models are just getting underway and progress needs to be evaluated, but it is planned that they will continue to receive support within NIE.

The Appalachia Educational Laboratory with USOE support is conducting experimental assessments of a host of different media for providing information about life styles of workers in selected occupations. Video tapes are used to show the worker on the job, in his home, and in his recreational pursuits. This is one of the studies in which impact data are being collected and it should continue to receive support.

Three potential areas of research are noted here. First, the longitudinal effect of intermediate goal achievement can be studied as it relates to over-all goals, e.g., does awareness of career information in grades K-6 contribute to the decision skills of those students when they exit in school at the secondary level? Second, improved methods of job analysis can be investigated to identify characteristics that are common to families of jobs, looking at alternative dimensions for establishing job clusters, e.g., functional, psychological, sociological. Third, anthropological studies can be made of how members of various target groups make career decisions, their information processing strategies, and the effects of cultural pressures and group stereotypes on their decisions.

In terms of development, NIE can support the design and development of alternative ways of providing career and performance information, e.g., preschool primers on careers, revised curriculum materials, manpower planning games, self-administering diagnostic assessment instruments, use of mass media, labor market projections, a national voluntary job information service, use of paraprofessional career counselors, regional

information networks, etc. Following that, comparative cost effectiveness of alternative procedures can be evaluated, field tests of the preferred alternatives can be conducted, and a dissemination system developed for them.

d. Recurrent cycle of education and employment. Beyond the problem of schools being isolated from the world of employment is the problem of jobs themselves being less satisfying. Job dissatisfaction is increasing and ameliorative efforts to redesign jobs by enlarging job responsibilities, rotating employees among jobs, and providing educational sabbaticals, are being tried by large corporations. Jobs are also changing rapidly with advancing technology. The rate of job obsolescence and rapid shifts in the nature of work demand a form of education that prepares people for change. Education must be more generalizable. An education system that offers experience in learning a wide variety of careers may provide more flexibility in students, may help them learn how to learn, and may develop a readiness for change, but flexible entry and exit between jobs and education will become increasingly more important in the future as the rate of job obsolescence increases.

Another problem that hampers career education is the dichotomy between academic college-bound programs and the general/vocational programs in secondary education. The schools and universities serve as gatekeepers in sorting out the students who will complete a college or university and go on to professional or managerial careers, from those who will leave high school or junior college and become members of the working class. The stratification of society into working and elite classes limits the career options available to the poor who drop out earliest. Recognition of this problem has led to a variety of reform proposals ranging from open college admissions to competency-based credentialing. The linear pattern of full-time schooling, for as long as one can persist, followed by a sudden transition to a lifetime of full-time work, with higher status and earnings for those who can afford to stay in school the longest, maintains a partitioned society with under-utilization of talent and economic loss and needs reform. Proposals to separate the selection function of schools from the education function by turning over the credentialing or certification responsibility to separate agencies may help to solve this problem. Allowing students to complete the mandatory portion of their education in early adolescence and giving them a certain number of additional years entitlement to education, usable at any time during their lives, may also help resolve the dualism resulting from the linear "schooling-first" pattern by replacing it with recurring cycles of work and education. Although this is a reasonable concept and should be subject to experimental trial, employers in large industries are unwilling to hire youth under 21 years old and use a variety of arbitrary hiring requirements to enforce this policy. In addition, most unions support the employer practices out of a concern for youth competition with their adult members over job opportunities and wage scales. Another obstacle to reentry is the problem of added financial responsibility of the older person.

In spite of these obstacles, the linear, school-first, then-work-for-the-rest-of-one's-life, pattern is too ineffective to be tolerated. The knowledge acquired in early years will not be retained throughout one's career, and has the effect of creating an artificial stratification of society into separate tracks, wastes talent and results in economic loss to the nation. In addition, it alienates large numbers of young adults who are aware that education credentials are generally unrelated to job competency and serve primarily as a convenient screening device for employers. Furthermore, a majority of today's high school students want to go to college—a much higher percentage aspire to college than actually achieve it (Department of Labor, 1970). The transition from school to work is not always a simple matter of leaving school and embarking on a lifetime career. In one follow-up study (Department of Labor, 1971, p. 21) more than one-tenth of a sample of young men not enrolled at the time of the original survey returned to school during the subsequent two-year period.

Hypothesis: If students are allowed to complete the mandatory portion of their schooling in early adolescence and are given a certain number of additional years entitlement usable at any time during their lives, the present academic–vocational dichotomy will be alleviated and a pattern of moving back and forth between education and career will be encouraged.

The necessity for short term commitments to careers in a changing society, moving in and out of careers, requires dramatic experimentation with alternative sequences of education and employment until a more effective sequence can be found. The traditional school-then-work pattern probably won't survive another decade. Now is the time to conduct the research so that answers will be available when this

policy issue reaches the crisis stage several years from now.

Promising current research includes the social accounts program at the Center for Social Organization of Schools at the Johns Hopkins University which examines career history data for indices of occupational assets and deficits. The data show that the effect of education on income is on the rate of increase in the occupation chosen rather than on initial income. This suggests that if alternative paths into high-growth occupations could be found, they would be nearly as effective as education *per se* since education essentially serves as a zero-cost screening device on the part of potential employers. These findings have implications for the transition between school and work and problems which arise from explaining the economic utility of educational attainment.

Several kinds of research studies are relevant here. We could investigate various incentive patterns that may permit the implementation of a shortened period of mandatory school attendance with a recurrent pattern of education and career. These patterns might include ways of financing students who wish to reenter the education systems, a national educational opportunities bank, a special loan program for returnees; or tax deduction incentives for corporations that enable workers to take sabbatical leaves for reeducation. Procedures can be studied for using educational vouchers to reimburse corporations and other public employers for on-the-job education programs. Simulation studies of the long range social effects of altering the time sequence of schooling are needed, from a school-before-job pattern to a recurring cycle of work and education. Historical, sociological, and anthropological studies are needed to invent new ways of inducing the non-school sector to accept its educational responsibilities.

Many areas of development are available here. NIE can eliminate tracking and general education by developing a lottery system for admission to various preferred classes and institutions for all students. For example, Parkway successfully used a stratified random procedure for its admissions policy. NIE can develop procedures for increasing the status of non-academic programs by experimental manipulation of incentives, setting up rules for admission that add to their exclusiveness, or requiring such programs of all students. For example, at certain levels career experience may be required for reentry to continue the educational sequence. The cost effectiveness of these alternatives must be evaluated, followed by field tests and demonstrations of the preferred patterns.

In another area, NIE can experiment with and evaluate school graduation by performance criteria rather than years-completed similar to the GED examination for a high school diploma. It can experiment with reducing mandatory attendance age and make provision for X years entitlement. A publicly accountable agency would issue a voucher for X years' schooling beyond graduation at age 14 for each eligible student. The voucher could be turned over to any school or university which had been designated as acceptable by the agency and it could be spent at any time during the life of the student. Another possibility is to develop alternatives to the academic year cycle in order to spread out job opportunities. Students could take vacations at different times. This is being tried in an experimental school in Oregon. A further possibility is to develop youth advocate positions in schools and universities to assist students who reenter after having left for a period of work experience. Finally, NIE can experiment with federally and locally supported non-school social service employment for adolescents having difficulty finding employment.

e. Tentative Budget for Career Education R&D, Fiscal 1973 and 1974. The following estimates are based on the assumptions:

1) That R&D on *career experience* and *career information* are of primary importance and should each occupy a large share of the career education budget. Since the bulk of the ongoing R&D programs are focused on the career information element (counseling, curriculum, etc.), no new research and development is recommended in that element for fiscal 1973.

2) That *career role models* and *recurrent cycles* elements are at the early stages of conceptualization and should each occupy a smaller share of the career education budget.

3) That the allocation of new R&D money should be approximately 10% for research and 90% for development. The development costs are expected to include not only the engineering of new systems through a succession of empirical evaluation-revision cycles but also experimental

Table 4

Tentative Budget for Career Education R&D
(in Thousands)

Program Element	Fiscal 1973	Fiscal 1974
I. Career Experience		
A. Current R&D		
Model II	500	4,000
B. New R&D		
Research	1,000	1,200
Development	5,500	6,800
	(7,000)	(12,000)
II. Authentic Career Role Models		
A. Current R&D	-0-	-0-
B. New R&D		
Research	250	300
Development	1,500	2,200
	(1,750)	(2,500)
III. Access to Career Information		
A. Current R&D		
Model I	7,000	5,000
Model III	2,000	1,300
Model IV	4,000	4,000
AEL	700	-0-
B. New R&D		
Research	-0-	200
Development	-0-	1,700
	(13,700)	(12,200)
IV. Recurrent Cycle of Education and Employment		
A. Current R&D		
Johns Hopkins Social Accounts	500	500
B. New R&D		
Research	250	300
Development	1,000	1,700
	(1,750)	(2,500)
V. Evaluation and Documentation	800	800
TOTALS	25,000	30,000

demonstration and dissemination costs. Hence the development costs are much higher than the research costs.

4) That current projections for career education (25 million for fiscal 1973, 30 million for fiscal 1974) are reasonable in view of the high priority given this area in USOE planning.

5) That current R&D work on the models, in the vocational education centers, on the projects at various educational laboratories, e.g., AEL, Johns Hopkins, should be completed, provided the work is evaluated as satisfactory.

6) That the proposed new program of R&D may be managed in a variety of ways, in an open unsolicited receipt of R&D proposals, or as a directed programmatic R&D effort targeted on specific outcomes and carefully managed from NIE. The decision on management style depends on a host of variables that cannot be determined yet, e.g., level and number of resident NIE staff members, degree of knowledge available in the various program elements, and the size and quality of the R&D talent pool available in the field that is willing and qualified to work on problems of this nature.

3. Home-Based Early Education (a sample outline for a proposed program)

The major purpose of early education programs is to enable preschool children to acquire skills and attitudes that will help them to be successful in later life. Middle-class and upper-class children normally acquire these early skills and attitudes in the environment of their own home and in planned activities initiated by their parents. However, opportunities for the disadvantaged child to acquire many competencies necessary to later success are often limited by a number of environmental factors, as well as by a lack of parental money and time. Therefore, the early education R&D efforts proposed in this section, like nearly all of the current federally supported early education programs, are concerned primarily with disadvantaged children.

A large number of R&D projects in early education are being supported by federal agencies. In general, these projects do not constitute a well-organized effort to develop one or more comprehensive programs for improving the early education of disadvantaged children. Instead, the majority of the projects represent isolated attempts to deal with rather narrow aspects of the child's early development. Neither the outcome variables nor the treatment variables are well defined in most of the projects.

The proposed R&D effort represents a more directed approach than now exists for development of comprehensive research-based early education programs. Several components appear to be very important in the development of effective programs. Included among these components are: a) learning outcomes and assessment instruments; b) home learning centers; c) coordination of school and home learning center programs; and d) neighborhood child-care information programs.

a. Learning outcomes and assessment instruments. One of the most commonly cited causes for the low school achievement of disadvantaged children is their lack of basic skills when they enter school. Examples of the basic things that a child might be expected to do when he enters school include the following: demonstrate knowledge of the meaning of a particular set of important words, follow oral directions to complete a simple three-step process, cooperate with other children in planning and carrying out group activities, and put together simple jigsaw puzzles. Currently there exists no comprehensive listing of skills that are basic to success for beginning school children. It is not possible, therefore, to determine objectively whether a child entering school possesses the skills assumed to be essential to his success.

A comprehensive listing of specific cognitive, physical and social-emotional skills that children should possess at various preschool age levels would be very useful in early education research and applied programs. Preschool programs could be designed so that some or all of the listed skills served as the learning outcomes to be attained by children in the program. The list of skills, or selected skills from the list, could provide a set of milestones for assessing the individual development of children for both research and educational purposes.

An important complement to a comprehensive list of skills or learning outcomes would be a set of assessment instruments for measuring development of the skills. Several researchers in child development have reported a serious need for improved assessment

instruments and techniques (Chapman, 1972). A set of measures keyed to important learning outcomes would facilitate evaluation of preschool programs and of the progress of individual children.

A number of early education R&D programs with either general goals or limited goals in one or more areas of development are currently supported by several federal agencies, including the Office of Child Development (OCD), the National Institute of Child Health and Human Development (NICHD), the National Center for Educational Research and Development (NCERD) in the Office of Education, and the Office of Economic Opportunity (OEO). Most of the current programs are input-oriented, with little or no attempt either to define the desired outcomes in advance or to control and systematically study input variables. Programs which have been designed to implement a well-formulated set of specific skills (e.g., Plant, 1972; Sprigle, 1972) have generally been limited to the area of cognitive development. One exception to the programs with either very general desired outcomes or a limited set of outcomes is the Harvard Project (Caldwell, 1972) which includes cognitive, affective and physical skills among its desired outcomes.

Based on their review of federal research and development activities related to early childhood, Stearns *et al.* (1971) report that goals for a comprehensive child development research program must be developed to provide a basis for research planning and that assessment instruments and techniques are also badly needed. Currently, there are no federally supported early education-related programs being conducted either for the purpose of identification of a comprehensive set of appropriate objectives for preschool-aged children or for the development of better assessment instruments and techniques.

Hypothesis: If children participate in early education programs aimed at development of a wide range of explicitly identified skills, the children will demonstrate better cognitive and physical skills and better social-emotional adjustment.

Several areas of research are possible. First, NIE can obtain normative data on development in children of the desired cognitive, social-emotional and physical skills without preschool intervention and determine recommended minimal levels of satisfactory development at various age levels. A second area would contrast the effects of early education programs employing as their desired outcomes a list of cognitive, social-emotional and physical skills and programs with no emphasis on development of specific outcomes. A related problem is to identify patterns of development of skills within and between areas (cognitive, social-emotional, physical) and between various subject populations. Long-range research can determine the relationship between early education outcome variables and achievement in various aspects of an individual's subsequent school career. Resulting data should enable NIE to identify effective methods for attaining particular outcomes or related sets of outcomes. Finally, NIE should conduct research for the purpose of costing attainment of the various outcomes and determining the length of time required for their attainment.

The areas of development resulting from research include: developing one or more comprehensive lists of skills to serve as guidelines for assessing development of children under age 6 and desired outcomes of early education programs; developing appropriate instruments and techniques for assessing young children's performance of cognitive, social-emotional and physical skills; developing exportable curriculum programs, including instructional materials and procedures, that are effective in promoting children's attainment of important sets of skills; developing exportable procedures and materials for training teachers of preschool-aged children in use of lists of skills and related assessment instruments to identify appropriate outcomes and instructional activities for individual children.

b. Home learning centers. Psychologists and educators generally agree that lack of opportunity to participate in a wide variety of educational activities in early childhood is one very important reason for the educational problems of many disadvantaged children. Such educational activities include exposure to a variety of toys, games and books; visits to nearby sites with high educational potential; and frequent verbal interactions with a parent or other adult. Whereas the middle-class child normally receives frequent exposure to these activities in the home, early participation by the disadvantaged child in such activities is often severely limited by lack of parental money and time. For the disadvantaged child, consequently, initial intensive exposure to many important early learning activities occurs in the more structured, formal and impersonal environment of the school or Head Start center.

An alternative to the more structured environment of a Head Start center or school for providing needed early learning activities would be a program operated for a relatively small group of neighborhood children by one or more neighborhood adults in the adult's own home. Such a program would involve selection and training of a neighborhood adult to serve as the teacher and to operate the program in her own home. Data reported by Gordon (1972) suggest that selected mothers in disadvantaged neighborhoods can be trained to be effective teachers of disadvantaged preschool children in in-home learning centers.

A home learning center program for small groups of neighborhood children (the geographic boundaries for a particular program could be established to include either a fixed area or a relatively fixed number of children) would have a number of positive features. A wide range of important early learning activities could be provided by a familiar adult for small groups of children in a home-like environment. The home learning program could be articulated with the above-described program involving development of a list of skills and related assessment instruments for preschool children, so that critical skills in all areas of individual development could be selected and emphasized in the home center. In addition, the home learning center would enable the child to make a much more gradual transition from his own home environment to the school environment. If necessary, the learning center could also provide a day-care function.

There are a number of current home-centered programs, including Head Start programs with a home component, activities sponsored or administered through public school districts or universities, various regional laboratory and center projects, and other Federal and state projects (such as the HUD Model Cities Program and OCD Project Home-Start). However, most Federal programs are linked to custodial day-care services; there is little effort to develop new programs with an R&D-based education component; university-sponsored programs are sometimes research oriented, are not representative, and therefore do not have generalizable results; most projects deal with both parents and children, and it is difficult to isolate the specific effects of the program; it is impossible to determine whether the services directed to the parents or to the children produce the most favorable results.

Many studies have dealt with programs aimed at training parents at home. This assumes a non-working adult; however, those unemployed often have significantly low social and/or cognitive skill levels, implying little probability of success for the program. This suggests that in-home centers using only selected parents as directors may be both less costly and more effective.

Hypothesis: If children are exposed to an in-home early education program, they will demonstrate better achievement and social adjustment during their school careers.

Significant areas of needed research are evident. NIE can:

Identify the factors (e.g., hours of operation, geographic boundaries for enrollment, type of program) which promote high rates of enrollment and attendance of children in the program;

Identify the characteristics of neighborhood personnel who can be trained to be effective educators of children;

Identify the type of home learning center program and environment most conducive to effective learning and social-emotional development;

Conduct longitudinal studies of the adjustment to school and achievement of children participating in home-centered programs; and

Compare the costs and benefits of home learning centers and other types of early education programs.

NIE can stimulate groups to.

Develop replicable, but simplified, programs for selection and training of neighborhood mothers as home learning center teachers;

Develop replicable procedures for identifying resources (persons, organizations, places

to visit, etc.) that can contribute to the learning center program within a city, accompanied by descriptions of related desirable instructional activities, learning outcomes, and procedures for obtaining the use or cooperation of these resources;

Develop, field test and refine a balanced home learning center curriculum (including recommendations for outcome and input characteristics, time requirements, teacher characteristics and training, estimating costs, etc.) to meet the needs of preschool children; and

Develop and field test a comprehensive plan to cover all phases of installation and coordination of home learning center programs throughout a single community or various types of communities.

c. Coordination of School and Home Learning Center Programs. The available research evidence (Coffman and Dunlap, 1971; Lazar and Chapman, 1972; Plant, 1971) indicates that disadvantaged children who demonstrate gains in IQ or achievement from preschool programs typically do not maintain these gains or perform better in school than other disadvantaged children. Unless a program that coordinates the preschool intervention and the primary-grade program is established, preschool gains do not appear to make long-term differences in either IQ or achievement (Lazar and Chapman, 1972).

Currently, most preschool and school programs exist quite independently of one another. There is little articulation between programs or exchange of information that leads to modifications in curriculum or in the instructional programs for individual children. Children who enter school bearing the "disadvantaged" label are typically treated as if they are indeed disadvantaged, irrespective of their prior educational activities and present skills. There is evidence that the poor performance of disadvantaged children in school is in part due to low teacher expectations for them (Henrikson, 1971), and that as a consequence of these low expectations, primary-grade teachers provide so few appropriate learning opportunities for children that the children have virtually no chance to attain normal standards of achievement, even when they have the capability to attain these standards under normal instructional conditions (Sullivan, 1972).

An R&D program on liaison procedures between the school and home learning center or preschool would have the potential for identifying the effects of several manipulable variables which could result in improvements in the child's school achievement. Included among these variables are factors related to the teacher's expectation level for disadvantaged children; attempts to articulate the objectives of the programs and to maintain continuity of learning tasks for individuals; initial part-day attendance at school by the child for reading and/or other instruction, combined with continued preschool attendance to facilitate further social development; and tutoring in the home learning center on skills for which the child's school achievement is sub-standard.

Presently there are very few efforts to produce significant correlation between school and home learning center programs. Therefore, long-term gains in achievement are infrequently realized. One program which does attempt this is the Head Start-Follow Through continuum. However, there is no explicit attempt to articulate skills or areas of emphasis, and the results are consequently ambiguous. A number of programs using tutoring by parents or other community people have produced significant increases in the skills which children learn at school, particularly reading skills (Niedermeyer, 1970; Sullivan and LeBeaune, 1971). The most successful programs explicitly provide training and materials in areas of concern.

There is a need to coordinate pre-school intervention and primary grade programs, possibly through individual instruction, and to encourage summer programs for children. It may also be necessary to provide intervention earlier and maintain it well into the elementary grades. Current efforts are beginning to realize these problems.

Hypothesis: If regular liaison aimed at promoting children's achievement and social adjustment is maintained between the school and home learning center during the primary grades, the child will adjust better to school and will demonstrate higher achievement.

Initial research should investigate methods for raising teacher expectations for achievement of disadvantaged children and effects of induced raises in teacher expectations upon subsequent input and outcome variables. One possible approach is to study the effects of attempting to establish higher teacher expectations for performance on selected important outcomes by increasing the amount of time that disadvantaged children spend on the outcome. This procedure would contrast with the common practice by

primary-grade teachers of establishing low expectations for disadvantaged children and allocating equal or, more often, much less time to the desired outcomes. A second approach might study the effects of determining the time of entry of children from the home learning center into the school program on the basis of their social development and skill acquisition, and phasing the child into the school program by gradually increasing the length of instruction and variety of school subjects. Basic to this research is the need to obtain normative data on the achievement levels of primary-grade disadvantaged children on desired learning outcomes when the children have been involved in instructional programs judged to be effective, and to determine recommended minimum levels of achievement at various times with each grade. A final area of needed research is a study of the effectiveness of various procedures, including use of paid adults or teenagers, for providing tutorial assistance in the home learning center for children not succeeding in specific skill areas at school.

NIE can affect practice by encouraging the following:

Development of a recommended list of objectives or skills to be attained by children in the primary grades; this list would be articulated with the preschool list for continuity of skill development and to avoid unnecessary overlap between programs and omission of important skills;

Development of criterion-referenced tests for regular use in the school program to assess children's attainment of objectives and to identify children needing remediation; and

Field testing and revision of the materials and procedures for articulation of various aspects of the school and home learning center programs, followed by development of a detailed plan for wide-scale implementation of the program coordination techniques that are effective in promoting children's adjustment in school and achievement.

d. Neighborhood Child-Care Information Programs. The danger of impairment to healthy human development is greatest during the period from conception through the first few years of life. Parent practices in caring for the child (diet management, exposure to appropriate learning activities and social experiences, etc.) during this period are extremely important to the child's subsequent development and to his success in later years. Because of such factors as the increased level of pollutants and other health hazards in many disadvantaged areas and the limitations in types of health-related goods and services available to low-income groups, use of good child-care practices may be even more important with disadvantaged children than with their more advantaged counterparts. Yet, many parents do not know or apply child-care practices that facilitate the healthy development of their children.

Both knowledge and application of good child-care practices are needed in the areas of health; social, intellectual and physical development; and nutrition. Also needed by many parents are information and assistance in obtaining child services available to them. An inter-agency effort to develop effective neighborhood-based programs has the potential for making a significant contribution toward fulfillment of these needs.

Numerous projects are designed to provide parents with adequate child-care information. Project Home-Start (OCD), several Federal extension services (such as the Expanded Food and Nutrition Education of the Department of Agriculture), and a host of state extension services have already been initiated in this area. Most of the effort, however, has been in the form of community action programs and neighborhood information services. Two basic inadequacies in most of these services are that they are aimed at only one area and they deal with problems identified by the researcher rather than the parents. There has been much more concern with simply making the information available than with studying the effects of such provision or insuring its application. Lazar and Chapman (1972, pp. 7-17) have attempted to explain some of the gaps that must be filled in order to promote the effectiveness of both on-going and proposed efforts in information provision. These gaps must be comprehensively defined and analyzed and corrective action taken.

Hypothesis: If a program of information and activities on simple, effective child-care practices is available to parents within their immediate neighborhood, parents will utilize improved practices with their children.

Research is needed to:

Identify the health habits and the incidence of various health problems among groups of high-risk individuals in order to determine areas of greatest information need;

Investigate the use of various publicity procedures and incentives for parents to acquire and use child-care information;

Provide both breakfast and lunch for preschool children and investigate the effects on various aspects of their development; and

Determine the most effective combination of means (mass media, neighborhood campaigns, home calls, etc.) for improving child care information and practices and the type of location that results in most frequent use of the information center.

In terms of development, NIE can:

Provide child-care information centers where parents and expectant mothers can come for help and can learn child-care practices that will promote better development of their children;

Develop a program through the information centers that coordinates and utilizes existing resources within a community to provide needed services for children, including both preventive and treatment services;

Develop procedures for identifying and securing child services that are needed but do not exist within a community;

Develop simple programs for regular child care that include free materials (toothbrushes, vitamins, recommended foods, game sheets, recommended parent-child activities, etc.) and distribute the programs through the child-care information center; and

Develop buying assistance programs that train parents in nutrition and consumer education, and that give food stamp bonuses or free guided buying trips to those who participate.

The R&D budget for program components over a five-year period is estimated (in thousands of dollars) as follows:

1)	Learning Outcomes and Assessment Instruments	$6,000
2)	Home Learning Centers	10,000
3)	Coordination of School & Home Learning Programs	4,000
4)	Neighborhood Child-Care Information Programs	5,000
5)	Evaluation	2,500

A budget of 2.5 million is proposed to initiate the effort in fiscal 1973, with $7 million provided in 1974, $8 million in 1975, $6 million in 1976, and $4 million in 1977.

4. Learner-Controlled Education

The challenge of open education lies in the vision of an open society rather than in the organization of an informal classroom, or even a "school without walls." An open society requires open access to knowledge for all individuals at every stage of life. It also requires extensive degrees of self-determination with respect to what is learned, when it is learned, and how. For education, then, the challenge is to find ways of developing the full range of each individual's capacities and to do so while (as much as possible) putting control of the learning process in the hands of the learner himself. For educational technology, the challenge is to apply technological discipline to the problem of developing viable learner-controlled educational systems.

This program, then, will be concerned with the provision of such control. It involves six essential aspects: (a) the choice and definition of educational objectives; (b) the organization and sequencing of objectives, i.e., the design of curricula; (c) the problem of displaying educational alternatives to the learner; (d) the provision of learner-control within a given instructional episode; (e) learner control of motivation; and (f) evaluation of competence. Of these six areas, all but one—the concern for displaying alternatives—have, in one form or another, been areas of concern for educational technology for some time, but this program also poses new problems for research and development in each of these fields.

This program for Learner-Controlled Education has, to date, been developed only in outline form. If the

program is accepted for further design effort, the Planning Unit will continue to expand the outline. Lauren Resnick, who developed the outline, has agreed to continue her effort.

Five-year budget estimates have not yet been made for the program, but approximately $2 million should be reserved for design during fiscal 1973 if the effort is to continue. In addition, the Task Force for this effort probably should manage and try to integrate the approximately $5 million in continuing programs from three of the Regional Laboratories and Centers.

Outline of R&D Program for Learner-Controlled Education*

I. Concept of learner-controlled education:

A. Education in which learner himself controls one or more of the following:

1. Choice of what goals to work toward;
2. Choice of materials, methods, and strategies of learning;
3. Choice of timing, i.e., when during lifespan to engage in study; pacing during learning.

B. Reasons for learner control:

1. In a society in which "bigness" often rules in the economic and governmental spheres, learner-controlled education provides a domain in which people can exercise individual responsibility and self-control.

2. Learner-controlled education is responsive to the diversity of goals that characterize a pluralistic society.

3. Learner-controlled education is a means of implementing basic principles of learning and instruction.

4. Learner-controlled education can permit flexible programs, with respect to when people enter and leave, etc. Educational activities can occur in widespread locations and at different times in people's lives. This allows economical extension of education, and flexible response to changing vocational and avocational needs of adults as well as young people.

II. Possible models of learner-controlled education: (These can be grouped roughly according to age-level, which in turn determines the kinds of goals that will be of dominant concern, and the kinds of capacities for self-directed education that can be relied upon.)

A. Infancy through early pre-school.

1. Goal at this stage of development is to nurture and develop general capacities for self-directed learning that will be called on later.

2. These general capacities include:

a. Basic cognitive abilities–linguistic, perceptual, conceptual, etc.

b. Ability to engage in self-directed and purposeful exploration of an environment;

c. A sense of mastery and confidence, particularly in one's ability to exercise control over his environment in socially acceptable ways;

d. Social skills, including abilities in giving and requesting help;

e. Physical skills–general body control and fine motor skills of various kinds.

3. Capacities to be relied upon in designing educational programs are mainly those of universal human striving for understanding of his world. Since much development in this period appears to have biological components (e.g., aspects

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* Prepared by Lauren B. Resnick, Learning Research and Development Center, University of Pittsburgh.

of perceptual development, physical development, language development), opportunities and demands of the educational program must respect these developmental processes.

4. Possible model is a nurturant environment, much free choice of activities, adults responsive to children's initiative, planned efforts to foster general capacities for learning.

B. Basic literacy period–roughly 4-10 years (time period will vary greatly for individuals).

1. Primary educational goal at this stage is acquisition of basic literacy in culturally necessary domains, of which the most important are verbal and mathematical literacy.

2. Other aspects of personal and cognitive development are not neglected, but individuals and educational systems will probably invest most of their resources in literacy development, since this is necessary for extensive learner-control later.

3. Capacities for learner-controlled education that can be relied upon at this stage are:

a. The capacities for self-directed learning developed at the earlier stages;

b. Children's desire to master culturally relevant skills such as reading;

c. Continuing drive to understand and master the environment.

4. Possible models are the "open" primary classroom, individualized instruction; perhaps a mix of both, in order to assure basic literacy acquisition in the context of a partially learner-controlled environment.

C. Exposure to information stage–from whenever basic literacy is established through early adolescence.

1. Major goals are to:

a. Expose the child to a wide range of information about the world–information on the basis of which he can make choices for the direction of his own life later; information which extends the boundaries of his world from his own family and social group;

b. Build skills in independent information gathering and information processing;

c. Build social skills, especially those involved in group activity.

2. Capacities now available include the crucial ones of literacy, also continuing development of reasoning and other culturally important skills. The child's ability to move around the city or country area makes it possible to use community resources, flexible schedules, etc., to a greater degree than before.

3. A possible model is a "school without walls," one in which children "sign up" for various activities, many of the extended "project" type. Skill and resource centers are located both within and outside the school building. Craft and technical skills as well as academic ones are called upon.

D. Adult stage–including later adolescence.

1. A great diversity of goals to match current interests and vocational preparation needs of individuals, which will include expressive goals, such as the arts. Technical skills may be acquired for their own sake, not only for vocational training purposes. Academic learning is available through lectures, seminars, "courses," programs, etc.

2. Resources to be relied upon are as varied as the goals. Education is seen as taking place throughout society and is not the special prerogative of "schools." Conversely, schools welcome a much wider variety of people and resources, and so the school/real life boundary becomes appropriately blurred. Individuals have developed skills and capacities during the preceding stages that permit them to use this diversity of resources effectively.

3. Model is one of open access to resources of community and educational resources.

III. Research and development necessary for the establishment and continuous improvement of learner-controlled educational systems fall into six major areas.

A. Choice and definition of objectives

1. Broadening objectives to which educational resources are devoted and developing useful means of stating objectives in domains other than the traditional academic knowledge and skill areas are crucial tasks.

a. Research question: Usefulness of different ways of specifying objectives must be explored.

b. Development task: Educational goals must be identified that match the interests of various social groups.

2. A second major concern is identifying and defining generative learning skills (i.e., "learning to learn" skills) appropriate to various stages of educational development.

a. Research questions: What basic capacities matter in learning of real-world tasks? Which of these will yield to controlled instructional efforts?

b. Development tasks: Development of applied education programs to teach learning skills.

B. Organization of objectives

1. The current condition in education is typically either "lockstep" or randomness with respect to sequencing and organizing of objectives.

2. The problem for R&D is to find the best balance between openendedness and structure in curriculum.

3. Research questions:

a. Identifying real dependencies and independencies among learning objectives.

b. Explicating the structure of subject-matter–the "what is to be learned"–so as to discover optimal patterning of content with respect to psychological processes called upon in learning. This is the growing area of "task analysis" in terms of cognitive processing demands.

4. Development tasks:

a. Develop modular and flexible systems that allow use of new kinds of materials and new objectives as they are developed.

b. Establish curricula that respect necessary prerequisites, but do not rely on arbitrary ones; curricula with multiple entry points and pathways.

C. Learner-controlled instructional methods

1. Research questions:

a. How good are people of different ages and educational experiences at "programming" their own learning?

b. What conditions optimize such self-programming?

c. What behaviors on the part of teachers are conducive to good "self-programming?"

d. What kinds of "tradeoffs" between learner control and efficiency are necessary?

e. Can tutoring programs help in developing self-direction skills in the learner and in the tutor?

2. Development tasks:

a. Wide varieties of instructional materials must be developed to accommodate various interest and ability patterns.

b. Examine industries and businesses that are successful in some aspect of education (e.g., language schools; computer training schools; secretarial schools) and incorporate their methods and perhaps their services.

c. Develop highly efficient teaching methods for the core cultural skills, and, where possible, for the "generative learning skills."

d. Develop materials and strategies for promoting investigations; these must somehow become "disseminable," although the greatest successes in this domain have up to now been largely "local" efforts.

e. Develop strategies for training teachers and other resource people in effective forms of instructional interaction in learner-controlled systems.

D. Display and access systems

1. "Open"-access, learner-controlled educational systems could lead to widening differences between privileged and less advantaged people, since the former group will know more about how to use the opportunities.

2. To assure functional equality of access, methods must be developed for:

a. Displaying educational options in forms that are useful to all segments of the population;

b. Teaching people to use these displays in the most productive ways;

c. Helping people clarify their educational goals so that they can use educational resources as productively as possible.

3. Research questions:

a. How good are people at choosing options that match their abilities and maximize achievement of their goals?

b. To what extent do people choose on the basis of plans and to what extent on the basis of a momentary capturing of interest. If the latter, are people potential victims of "packaging" competition?

c. How do people use competence models? Most research in the area of modelling has been concerned with social behavior. What is the role of modelling in the acquisition of intellectual and technical competencies?

4. Development tasks. Several models of display and access of educational resources should be developed and then studied for their effects.

a. One model is "information retrieval." Educational resources are treated like items in a (computer-accessed) library catalogue and individuals learn how to interact with the information-retrieval system to find the resources they want.

b. Another model is that of "browsing" among alternatives. This is the one that characterizes the "open classroom." One problem here is how to display the outcomes possible for given resources (i.e., what you can do with each). One solution is modelling.

c. Another model is of "counseling and guidance." To the extent that requirements and fixed routes disappear in education, a greater demand is placed on guidance; effective methods, suited to a learner-controlled, adaptive system, must be developed.

E. Measurement

1. In a learner-controlled educational system, tests designed primarily to select and compare students can be expected to play a decreasing role, since access to particular educational activities will be based on the student's interests, together with his command of specific prerequisite competencies. This does not mean, however, that there will be no role for testing, but rather that testing methods will be needed that are useful in instructional decision making, particularly for the learner himself, but also for his teachers and parents.

a. The learner needs to find out whether he is making progress toward his objectives.

b. The learner needs to know if he meets prerequisites for some educational activity.

c. The learner needs to know what the competencies are that he is working toward in as explicit a form as possible. Tests can help to provide this information.

2. R&D tasks:

a. Development of methodologies of testing suitable to the above requirements. Work already begun under the title of domain- and criterion-referenced testing.

b. Study of the ways in which these tests are used by learners, teachers, guidance people, parents, etc.

c. Establishment of kinds of ability testing that could help learners in making instructional decisions. Past work on aptitude-treatment interactions has turned up no useful measures for this purpose. A new approach seems to be required.

d. Development of tests for outcomes other than the traditional academic ones.

F. Evaluation

1. Evaluation, always difficult, is more difficult than ever because of the multiplicity of goals and activities involved.

a. Stodolsky's work points out that free-choice "curricula" are actually a multiplicity of curricula, and that different outcomes can, therefore, be predicted for different individuals.

b. Educational systems must be examined, with respect to how they meet both "consumers" (i.e. learners') and "sponsors" (i.e. society's) needs.

2. R&D Tasks:

a. Develop approaches to evaluation that respect this pluralism and still provide information educational sponsors and users need to decide what is worth maintaining and using. Cooley's paper, Campbell's work to be cited as relevant discussions. Perhaps also Bormuth's recent work on cost-effectiveness measurement.

b. Descriptive research that tells us *how* learner-controlled education works, as well as *whether* or not it is working as needed. This is particularly necessary in the early stages of a new educational venture; it helps to identify the crucial questions and to provide a basis for continuous refinement of the system itself.

IV. Steps toward implementation of a learner-controlled education program

A. Research questions identified require activity on the part of a variety of scholars often, but not always, in cross-disciplinary investigations. Some examples:

1. Psychologists studying structure of subject matter, nature of generative learning skills, people's abilities in self-programming, how interests and "displays" interact, social behavior in learning contexts;

2. Sociologists studying the relation of educational goals to social structure and position, the ways in which different social groups make use of learner-controlled resources;

3. Anthropologists describing "educational cultures" that emerge in learner-controlled systems;

4. Economists studying costs and feasibility aspects;

5. Measurement and evaluation experts developing testing and evaluation strategies.

B. Some kinds of research (especially descriptive and evaluative types) can occur only *after* first-approximations to learner-controlled educational systems are actually operating. Thus, development must occur simultaneously with research. This makes Centers, Labs and other organizations in which research and development people are in working contact with one another, ideal locations for development work. A period of R&D activity is necessary before widespread dissemination of particular components, in order to prevent faddist solutions. Some of the people who may be called upon in development work include:

1. Instructional designers; those with expertise in lesson-writing and design of educational environments;

2. Test developers;

3. Information retrieval specialists–perhaps in departments of library and information sciences;

4. Teachers and other resource people with demonstrated competence in managing learner-controlled education.

5. Unbundling Higher Education

Institutions of higher education perform several different functions tied together in one package and offered to students on a take-it-or-leave-it basis. This furnishing of unneeded services along with desired services and requiring students to purchase all is wasteful of both institutional and student resources. In addition, it enables institutions to resist the introduction of technology or other innovative practices.

The purpose of this program is to introduce greater flexibility and productivity into the system of higher education by: (1) defining the now "bundled" functions of universities and colleges (including the educative, credentialing, distributive, social, and role-model functions); (2) incrementally developing specific unbundled services until they can compete successfully with the traditional total-package arrangement; and (3) developing a plan for offering the variety of higher educational services through discrete agencies.

Development of curricular materials which can be

studied independently of institutional settings appears to be one of the most essential items in an unbundling program. Appropriate credentialing mechanisms are also important, because without them the student would not be in a position to choose alternative forms of instruction. In addition, technological devices, such as interactive cable TV and computers, extensive tutoring and counseling services, and use of private and public "industries" as training agencies would be part of program consideration.

In short, the notion that *only* formal institutions of higher education can have educating functions is unproductive. It would be far more useful to visualize a variety of educative functions in virtually all structures of society.

A short statement describing this program appeared in the Planning Unit's January 20th interim status report. Since it still represents a consensus of Planning Unit views, it is not presented again, but is available on request. If the program is accepted for further design effort, Dr. Harold Hodgkinson has agreed to help expand that statement, including the provision of estimates. In the interim, 1973's initial year budget projection for design and development is tentatively set at $2.5 million.

6. Community Education Agencies

This program is suggested in response to the fractionated communities everywhere that are in need of radically new institutions to bind them together while promoting pluralism. It is a proposed experiment for a new organizational structure and a new way of governing education for the community. The effort involves developing variations in how we link educational service to families, to neighborhoods, and to metropolitan areas; and proposing experimentation with governing mechanisms, organizational structures, and use of resources. Alternatives such as the family assistance agent, family tax credit models, neighborhood voucher or neighborhood corporation models, or public foundation models will be considered for experimental development in the program. The emphasis is not upon planning substantive changes, but upon providing mechanisms that will allow local genius to devise educational programs to meet the needs of all ages. Finally, a major research effort—a longitudinal study of communities in their natural state—is also suggested as a part of this programmatic effort.

The program is, thus far, developed only in outline form, with the outline presented on the following pages. If the program is accepted for further explication, Marc Tucker, the developer of the outline, has agreed to continue this explication. The general budget range for the program over a five-year period is $25-40 million. In this R&D agenda, $2.5 million has been suggested as the necessary funds for fiscal 1973 design and development efforts.

Outline for Community Education Agencies

Topic A: Systematic Variation of Alternative Governance and Organizational Mechanisms Linking Available Resources to Educational Needs of Various Community Groups.

General Background

1. Educational institutions dysfunctional. The institutions formally charged with the educative function are widely perceived by their clients of all ages as dysfunctional, nonresponsive and inflexible.

2. Institutions responding to needs of their professionals. In part, educational institutions suffer from their own success in producing a society of professionals. As specialization increases, it produces reward systems that increase the pressure to professionalize all forms of activity. Each profession, including education, molds institutions responsive to its own needs rather than the needs of its clients.

3. Institutions unresponsive to technological change. Institutionalized education has failed to adapt to changing technologies. Though most educational institutions still behave as if their principal mission was to transmit information, that function is rapidly being taken over by other agents. The advent of community cable systems, for example, will bring the average citizen into direct and interactive contact with an almost unlimited supply of information from almost every conceivable source, unmediated by "educational" institutions.

4. Institutions unresponsive to societal fragmentation. Institutionalized education has failed to produce an appropriate institutional response to the dispersion

and fragmentation of its client groups and to the fluidity with which those groups form and recombine. Educational institutions continue to offer programs based on assumptions of homogeneity of values, aspirations and backgrounds of client groups in an era characterized by fundamental clashes of values within and between ethnic, racial, socioeconomic and geographically defined constituencies.

5. Institutional failure promotes alienation and community failure. The failure of educational and other institutions to respond to the specific needs of components of an increasingly fractionated society have produced a society characterized by alienation of man from man, man from his institutions, institution from community, and man from community. Many community members appear to exhibit a sense of impotence, powerlessness, estrangement and a lack of sense of personal worth in relation to self and others, or of belonging to a community.

6. Cost of maintaining existing institutions places unacceptable limitations on corrective action.

   Educational institutions and the educational professions represent an enormous fixed cost. Some eighty-five percent of most school budgets is tied up in salaries. Flexible funds for all of the experimentation in most districts represent at best some three percent of total expenditures. It is little wonder that experimentation has not produced major change. There is little likelihood that major transformations in education can be brought about until the flexible resources approach twenty-five percent or more of the total budget.

   The costs of the present educational institutions, structures and professions have been rising much more rapidly than community income. Provision of substantial additional educational services to community groups not now receiving them to correct the problems cited above is beyond the fiscal capability of most taxing units if the new programs represent additional costs over the fixed costs referred to above. The existing institutions must be reorganized to free and reallocate more of the resources tied up in present structures.

7. New mechanisms of governance and organization required.

   A central problem of education in community settings is to invent new governance and organizational mechanisms for the education of entire communities that will provide the essential linkage, integration and synthesis functions to overcome the sense of alienation and lack of community generated by our rapidly fluctuating society and perpetuated by the institutions formally charged with the educative function.

8. Assumptions underlying suggested approach.

   Development of the new methods of governance and organization of community education must proceed from the following assumptions: (a) no single institution can meet the needs of any given group, whether defined by age, race, ethnic background, class, or societal function; (b) the nature of client groups, however defined, will change rapidly as new alignments destroy old groups and create new ones; (c) the agency must be a broker, not an owner, of resources; (d) it must respond to, support and recognize the legitimacy of small groups while at the same time finding ways to bind these shifting groups together in a larger community.

9. Goals of the new agency.

   The overarching goal of the new linking agency should be the production of an educating community that addresses itself to cognitive, psychological and social needs of its members in an integrative, synthetic fasion. It should seek to: (a) give those affected by its decisions a feeling of the legitimacy of those decisions; (b) create a sense of control, of power to influence, among those it affects; (c) create a sense of meaningfulness, of self-worth and purpose; (d) create a sense of intimacy, of belonging; and (e) accommodate and promote pluralism of all sorts, from basic values to individual and group life styles.

10. Proposal for NIE action.

    We therefore propose that the NIE undertake a program of systematic variation of alternative governance and organizational mechanisms linking the resources available with the educational needs of various client groupings, based on the following hypothesis.

Hypothesis: If appropriate new designs for the governance and organization of educational resources were formulated and implemented, the capacity of communities and subgroups within communities to achieve a broad range of cognitive, psychological and social outcomes for all their members would be significantly enhanced.

General Research and Development Program

The NIE should deliberately attempt to stimulate social experiments designed to test the differential effects of a variety of governance and organizational mechanisms on the capacity of communities and community groups to achieve a broad range of cognitive, psychological and social outcomes for their members.

The experiments would vary in three dimensions: (a) the form of governance; (b) the nature of the client group; and (c) the scope of functions over which the group exercises governance.

With respect to development, NIE would provide financial support to selected communities for planning, coordination and technical assistance. Limited funds would also be provided to augment program funds for a specified period. In no case would NIE fund the entire operating costs of an experiment.

Possibilities for variance along the three dimensions are outlined below.

1. Governance

In general, we envision a community educational agency that has jurisdiction ultimately over resource allocation for substantially all educational functions of the community for people of all ages. The key functions of the agency would be to adjudicate among demands for resources from particular client groups; to identify, develop and distribute resources; to link individuals and groups in the identification of needs, program development and organizational development. In each case, the client groups would control the definition of program and the nature of resources required to conduct the program. Thus experimentation with governance and organization is required at two levels: the community education agency itself and the client groups it supports.

A wide range of governance forms should be considered for one or both levels, varying with respect to degree of participation required, sanctions available, and resources controlled. Among them are:

town meeting	commune
regulatory agency	republic
private foundation	democracy
extension agent	individual voucher
multi-national corporation	family voucher
consulting firm	community voucher
everybody-a-teacher	
engineering or formal planning	
school board with increased jurisdiction	

2. Client groups

"Communities" generating programs should vary from individual families, or even individuals, to large metropolitan areas. Clients may be grouped by geography, work, function, age, handicaps, interests, identity, and by clusters and cross-classifications of all these. Since individuals are simultaneously members of many such groupings, one would not expect classifications to be stagnant, but would expect a great deal of fluidity as various programs develop.

Among the classifications of client groups that should be selected for participation in the program are:

metropolitan area	functional clusters
city	racial groups
small town	ethnic groups
neighborhood	age groups
other geographic areas	
families (extended and nuclear)	

3. Functions

The functions performed by the experimenting agencies should also be subject to patterned variation to include experiments limited to a single function (e.g., consumer education for older people) to multi-functional programs involving educational, social, psychological and physical components for large groups.

The NIE should systematically vary different mixes of functions, client groupings and governance mechanisms. The program should begin on a small scale in areas where legal and social factors are conducive to experimentation. Each experiment, once funded, should permit very broad latitude for the community to evolve its own program. A large portion of the allocated funds should be devoted to the independent evaluation and documentation of each experiment to support replication and improvement of the models developed.

The topics addressed below are intended not as prescriptions but as illustrations of experiments that might be funded. The last topic describes proposed studies of communities in their "natural state." These descriptive studies would substantially improve the basis for educational policy decisions whether made by local communities involved in the proposed program or by any other body.

Topic B: Alternative Models to Link Educational Services to Families

Governance mechanisms relating resources to family units provide an experimental setting which has the capability of maximizing the principle that one should have control over one's own destiny. A major concern in any experimentation with governance models on the level of family units should be the inherent danger that such models may lead to greater, not less, fragmentation. Care must therefore be given to provide linkages with the rest of the "community."

Examples of the forms of control which might be tried are:

Family Voucher Model

Vouchers could be redeemed by the family for any number or combination of educationally related services. Vouchers might be used to provide families with alternative schooling choices, as described most recently by Coons, *et al*, and Jencks. Although much discussed, the Jencks (OEO) voucher has not been implemented and the Coons "family power equalizing" model has received even less attention. Both are worthy of experimentation. Vouchers redeemable for supplementary educational goods and services such as books, tutors, music lessons, etc., might prove easier to implement initially and should provide some insights as to how implementation on a larger scale might take place. The alternative school voucher suffers under a severe handicap since it represents a direct and frontal assault on one of the best established of the governance models, the local school board. Perhaps vouchers redeemable for use in preschools and child care centers would be less threatening and hence more politically attractive.

Vouchers could also be issued and made redeemable throughout the life of the holder, thus offering options to the age-constrained and unbroken pattern of a period of uninterrupted schooling followed by a period of uninterrupted work.

Family Assistance Agent Model

This model would be characterized by groups of families selecting from among a set of trained "family assistance agents" one agent to represent them.

1. The Family Assistance Agent (FAA) would be backed by legal and financial authority to command response from educational and social service agencies charged with providing family service.

2. The FAA would help families diagnose areas in which they needed or could use help, and help them select kinds of help, if any, that they would desire.

3. The FAA would serve on a limited term contract to that set of families. They would decide periodically whether to renew his contract or seek a new agent. Groups of families could also split up and regroup with other families from time to time.

4. Family groups could be formed on any basis whatsoever: geographic area, functional association (all worked together, all had children the same age, all were elderly, etc.), friendship, or anything else. No family could be a member of more than one group, but all would be a member of one.

Family Tax Credit Model

This program would encourage families to move in generally accepted socially desirable directions by providing tax credits for moves in those directions.

Examples might be:

1. Limiting natural children to two and adopting children for third or more child. Extra credits might be provided for adopting of minority or handicapped children.

2. Attaining additional education–any member of the family could receive tax credits for successfully achieving a higher level of education. The amount of the credit might also be weighted according to where the person began, with larger inducements for the least educated.

3. Time devoted to special areas of need–credits might be awarded for volunteer aid to hospitals, or clinics, or homes for the mentally retarded; work with various social projects, such as litter control, recycling, or tutoring youngsters with special needs.

4. Credits to encourage women to return to the labor force.

Topic C: Alternative Models to Link Educational Services to Neighborhoods

One client group of educational services is the neighborhood. Simply defined, a neighborhood is a group of people who inhabit a defined geographic area and who see themselves as in some way separate and distinguishable from those around them. There is evidence that neighborhoods can be defined, even in large and complex cities. Some "new towns" such as Reston deliberately create neighborhood units with some governmental responsibilities. The essence of a neighborhood group is that it is self-defined.

Examples of functions which might be placed under the control of the neighborhood governance mechanism include: neighborhood public schools; neighborhood kindergartens; preschools or day care centers; evening/adult and unemployed/job retraining classes; educational programs presently run by service agencies such as the YMCA, Boy Scouts, etc.; and general recreation programs including parks, playgrounds, swimming pools and other recreational centers.

Examples of the forms of control which might be tried are:

Neighborhood Voucher Model

Neighborhoods would apply for vouchers which could then be used to purchase services to meet a variety of neighborhood educational needs. A neighborhood voucher would differ from a typical grant in that the allocation of the resources would only be restricted within broad, general, problem-related categories. For example, a neighborhood could apply for a voucher to solve the problem of poor nutrition among preschoolers. The voucher would only be redeemable for purposes relating to that problem but could be used to select from a wide variety of alternative solutions, ranging perhaps from nutrition training for mothers to providing meals. The emphasis should be on solving a neighborhood's self-perceived problems by any methods the neighborhood may choose and not by the imposition of predesignated, bureaucratically designed programs.

The vouchers might be granted for limited time periods with regular reporting and evaluation components to garner evidence for possible renewal and dissemination. Such a system might also generate sets of alternative schools whenever neighborhoods could agree upon their desirability.

Neighborhood Elected Education Board Model

This model would be characterized by:

1. Neighborhood boards with control over all of the public funds which would go to their public schools, including such categories as teacher salaries, materials, building maintenance and capital equipment.

2. Policy-making power appropriate to the power over funds, including such things as the power to determine the nature of the school organization, staffing patterns, length of day and year, hiring and firing, and substantive curricular offerings.

3. Funds allocated to neighborhood boards on a sliding or weighted scale, giving additional funds per pupil to neighborhoods with large concentrations of minority or low-income students, or deteriorating physical plant.

4. Broad guidelines and standards established by the city-wide school board; these would be goal-oriented and functional, rather than specific and descriptive.

Neighborhood "Educational Extension Agent" Model

1. An agent assigned by the city or state to serve as the linkage mechanism between any particular self-defined neighborhood and the educational resources of the city and state.

2. The agent would help the neighborhood diagnose its educational problems. He would have legal and financial control over, and access to, such experts as he needed to do an adequate diagnosis of a neighborhood's problems. He would work with the neighborhood people to teach them how to make use of the advice of the experts.

3. The agent would have the ability to command resources from various city and state educational agencies with respect to finding solutions to his neighborhood's problems: basic research people, developers, planners, demonstration events, even physical trips by neighborhood people to see projects in effect elsewhere.

4. The state would back the neighborhood extension agent with training programs, dissemination arms, legal authority, and substantial flexible funding.

Neighborhood Corporation Model

This model would be characterized by:

1. A public, nonprofit corporation in which all members of a neighborhood participated by virtue of their residence in the neighborhood.

2. An elected Board of Directors from neighborhood people.

3. A hired executive staff responsible for administering the public funds controlled by the corporation.

4. Receipt of legal control of public funds granted to the corporation by the city and state to run certain educational functions for the neighborhood, which could include the schools, day care centers, adult and elderly training programs, and even recreational and parks activities.

5. Responsibility for meeting such legal constraints and conditions as cities and states may require of such public nonprofit corporations.

Topic D: Alternative Models to Link Educational Services to Metropolitan Areas

In metropolitan areas it is the linkage function which is probably the most critical and certainly among the most neglected. Paradoxically, the resources and the problems of the metropolitan area are both unmatched by any other local units. Within a metropolitan area one can find scores of scholars, artists, actors and other personal resources along with museums, zoos, art galleries, sports arenas, diverse communication resources, etc. and yet with all that, city dwellers have the highest degree of anomie and alienation and the lowest perceptions of control over their destiny and sense of self-fulfillment. There is every indication that many urban schools throughout the United States will soon collapse. The flight to the suburbs is taking the urban core's brightest, most highly motivated youth away from what is the most available source of valuable resources. It is our hope that improved linkage systems like the models described below can stem the tide of desertion and improve education for entire metropolitan areas.

Public Foundation Model

1. A corporate board of popularly elected members would meet periodically to make grants for educational activities on the basis of staff recommendations.

2. A fixed percentage of the funds would be allocated to neighborhood corporations, for stated terms. Neighborhood boundaries would be adjudicated by a subcommittee of the board.

3. A fixed percentage would be reserved for applications from groups transcending neighborhood boundaries (e.g., science enthusiasts requiring a specialized facility, a Montessori school with metropolitan enrollment, consumers desiring a metropolitan approach to environmental hazard education).

4. A fixed percentage would be reserved for development of foundation staff to carry out policy analysis, research, development, evaluation and technical assistance activities in support of grant programs.

Representative Town Meeting Model

1. An educational finance committee would be appointed from among the citizenry by a committee consisting of the senior member of the judiciary, the mayors of the component municipalities and the chairmen of the legislative units in the component municipalities.

2. The citizenry would elect a board of selectmen to administer the expenditure of educational funds and prepare an annual metropolitan warrant containing articles authorizing expenditures for particular educational purposes.

3. The board of selectmen would appoint citizens to serve without pay on various committees dealing with particular educational matters. Citizens could petition for the formation of standing or *ad hoc* committees on particular subjects.

4. Citizens from each neighborhood would elect representatives to attend the annual metro meeting to vote on the articles in the warrant. The finance committee would present an analysis of and recommendation about each article in writing and orally to the metro meeting members. Arguments for and against each article could be made on the floor of the meeting by anyone present. The moderator would be elected by popular vote of the metro citizenry.

Multi-National Corporation Model

1. Vouchers would be issued to individuals annually for life by the state, to be exchanged for education provided by commercial concerns.

2. Profit-oriented corporations would organize subsidiaries to meet the needs of specific populations, each subsidiary to be semi-autonomous with respect to its own method of operation, subject to annual review by the corporate headquarters of profitability and certain key "production" measures. Each subsidiary would be managed as much as possible by "nationals of the host country."

3. Corporate headquarters would retain control over investment, management recruiting and development, and research and development. It would merchandise to its subsidiaries certain services, like cable communications, that they could use in common.

4. The state would establish a division of its consumer protection agency to protect its citizens against shady corporate practices.

Topic E: Longitudinal Studies of Communities in their "Natural" State

Hypothesis: If community policy makers at all levels had better information concerning differential impacts of a broad set of variables on the full range of desired educational outcomes for community members, significant improvements could be made in the design of community education programs.

Background

1. Though the Coleman report cast into doubt much that was thought to be known about causes of variance in outcomes of schooling, it contributed nothing definitive to new knowledge on the subject (e.g., what are the specific educational influences of television on which population groups, in which settings?)

2. Outcomes of schooling are frequently confused with outcomes of education. Little is known about the degree of positive correlation between attainment of schooling objectives and the ability to lead a satisfactory life in all the dimensions considered important.

3. Relatively little consideration has been given to the interaction between variables causing differing educational outcomes for individuals and variables causing differing educational outcomes for groups, institutions and communities (e.g., healthy schools, healthy churches, healthy political institutions, etc.).

4. Little if any work has been done to develop conceptual models describing factors causing variance in the educational health of entire communities or other social units. One particularly important set of variables about which we know little, for example, is the set associated with a sense of belonging to, or membership in, a community. Another is the set that contributes to individual and group sense of purpose and influence over others (e.g., how does the formal and informal pattern of governance of a community and other aspects of its "hidden curriculum" affect the individual's sense of membership in the community and his sense of self-worth?)

5. Significant work has been done in the delineation of stages of individual growth and development with respect to moral, cognitive and social areas. But almost nothing is known about the influence of particular community settings on individual growth and development.

6. In general, communities have not been perceived or studied as complex educating mechanisms having educational influence over all the members and institutions within their sphere. Curiously, communities have been studied as delivery systems for the provision of physical and mental health services, as economic systems, etc. Until such studies are performed from the perspective of education, educational policy will be made on the basis of wholly inadequate assumptions about what does and what does not affect educational outcomes under particular circumstances, and why.

Possible Research Activities

1. Search the literature on human development, with particular attention to assertions about mechanisms contributing to maximization of development, to generate hypotheses concerning human development in particular community settings that might be tested in descriptive studies.

2. Search the general sociological literature and the literature on mental health and organizational development to generate hypotheses concerning the therapeutic educational effects of different institutional settings that might be tested in descriptive studies.

3. Conduct long-term (15 to 20 year) longitudinal studies in 10 to 15 communities to determine the factors contributing to variance in the attainment of a broad range of educational variables for all segments of the community population.

   Communities should be selected so as to represent different geographic localities, population densities, economic characteristics, etc. Communities, subcommunities, population groups and institutions should be selected for intensive study that should vary widely with respect to their success as educating entities in order to isolate factors which account for variance. (What makes one ethnic group, church, school, family or social class more successful as "educator" than another in a particular community setting or in general?)

   Studies should be conducted in two stages. In the first stage, perhaps two years, conduct retrospective case studies of individuals particularly successful in identified goal dimensions and trace through depth interviews the forces that appear to have contributed the most to the specified outcomes. Using first stage studies to provide clues as to sources of variance, the second stage studies would consist of the large-scale studies outlined above, in which different groups of different ages would be tracked through a 15- to 20-year period to determine sources of educational variance. Outcomes to be studied might include such dimensions as sense of self-worth, sense of accomplishment, sense of personal efficacy, sense of membership in a human community, economic achievement, sense of purpose, etc.

Possible Development Activities

As a part of research studies outlined above, develop instruments and methodologies that would permit any community to study its own educational processes and to make decisions based on such studies.

IV. SUMMARY OF BUDGET AND MANAGEMENT SUGGESTIONS

FISCAL 1973

The NIE interim structure described in a supplementary document proposed three main substantive operating units: a Bureau of R&D Resources, a Bureau of Educational Systems, and a Bureau of Directed Programs. For each Bureau the placement of programs, budget allocation, management style and

personnel requirements should reflect program purposes and characteristics. Therefore, this section of the report provides suggestions concerning the way program characteristics should be reflected in organizational planning.

A. Bureau of R&D Resources

1. Programs

Programs suggested for this office are unsolicited basic and applied research, directed intramural research, researcher training, and management of developing institutions.

2. Budget

The budget suggested for this Bureau in fiscal 1973 is approximately $20.5 million. This figure, which includes personnel costs, is about 17% of the total NIE budget. The budgets suggested for the Bureau's component programs are $12,000,000 for basic and applied research, $5,000,000 for researcher training (including a small grants program) and $2,000,000 for developing institutions.

Allowable support for intramural research is $3,000,000, with $2,000,000 of that drawn from the basic and applied research area for internally directed research programs, and $1,000,000 from Researcher Training for an internal apprenticeship program. Because the Institute is in its first year, the availability of people for intramural programs and the speed with which the programs can be initiated is unknown. Therefore, the $3,000,000 allocation for this function is suggested as an upper limit only, allowing funds to be spent either intramurally or extramurally.

During fiscal 1972, about 65% of all funds for basic and applied research were spent in the learner goal area, with about 50% going to the cognitive development goal. About 5% went to research in the enabling goals, and about 30% to research in system goals. A change in balance is recommended for 1973, with 55% going to learner goals, 15% to enabling goals, and 30% to system goals. Within learner goals, the allocation of research on cognitive development should be reduced to 35% in favor of a higher budget (15%) in the social-emotional goal area.

3. Management Style

The Office of R&D resources generally will call for a supportive mode of program management. This requires that adequate publicity be given to the areas in which the agency plans to support research or researcher training. The primary emphasis will be in enticing first-rate scientists and bright young scholars from a wide range of disciplines to get involved in research on education-related topics. The participants and clients of this office include university researchers from a wide range of academic disciplines, e.g., anthropologists, sociologists, psychologists, historians, etc. The primary program management activities generally center around the decisions of which applicants to support, whether the grantee has fulfilled his agreement, and how the project results should be disseminated. The contractor, because he is the expert in this area, needs little monitoring.

4. Personnel Requirements

The number of people that manage contracts should build up gradually, beginning with people for the ongoing projects and adding staff as new projects are undertaken. One scheme for estimating needed management staff by salary levels is found in Table 5. This suggestion provides for slightly higher staff levels than USOE has in its R&D program, and accounts for differences in staffing due to size of contract. That is, the larger the contract, the smaller the proportion of program funds needed for management. Obviously, such a scheme must be experimental, but it would provide a more rational basis for allocating personnel than is currently used.

Staff for the unsolicited basic research program should not only have management skills, but substantive experience in the mix of disciplines represented by each of the goal areas. These people will be able to maintain professional contacts with researchers in the field, to judge quality of work, and, when called upon, to serve as temporary staff in the problem-solving areas.

The intramural research should be carried out by small teams of people assigned to specific projects. The size of the internal research group should be flexible, but a reasonable average for 1973 might be four senior researchers, four associates (about a new Ph.D. level), six assistants, and three secretaries. With three such internal research groups, NIE would need 51 intramural researchers in the Bureau of R&D Resources.

Table 5

Unsolicited Research Contract Management

Contract Size	Staff Required by Level* and Number of Months				Personnel Costs of Management (including overhead)
	I	II	III	IV	
Below $100,000	0	1	2	1	$6,000
$101,000-300,000	0	2	2	1	8,500
$301,000-650,000	2	2	4	3	20,500
$651,000-1,000,000	4	4	6	6	38,500
Over $1,000,000	8	8	12	12	77,000

Examples of percent management costs by sample contract sizes are as follows:

$ 50,000	12%
200,000	4%
475,000	4%
775,000	4%
2,000,000	3%

*Mean salaries suggested for staff levels are:

I	$30,000
II	20,000
III	10,000
IV	8,000 (includes secretaries)

B. Bureau of Educational Systems

1. Programs

Programs suggested for this Bureau are Experimental Schools and the four specialty areas of Instructional Personnel, Curricular Programs, Organizational Change, and Planning, Management and Evaluation. Though most work in the Specialty Areas is done by Regional Laboratories and Centers, this is not the only source of support for those organizations within the 1973 R&D agenda.

2. Budget

The suggested fiscal 1973 budget is $54 million or about 45% of the total NIE program budget. $30 million of this amount, double that of fiscal 1972, is provided for Experimental Schools, with $21 million for the four specialty areas of Instructional Personnel, Curricular Programs, Organizational Change, and Planning, Management and Evaluation. The remainder of the $54 million goes to personnel costs; the allowable intramural research funds to be taken from program funds is $1,000,000. The major budget change since fiscal 1972 is a doubling of the Experimental Schools budget. Level funding or small decreases are proposed for the specialty areas.

3. Management Style

Programs in this Bureau will be characterized by procedures that encourage planning and implementation of improvements by school systems, State departments, and other education agencies. The activities will often result from the initiative of the client, but will occasionally be a result of NIE initiative. Clients will include developers and school agencies that adopt R&D results. Relationships with school systems will normally be through a non-demanding contract and of a supportive nature. Use of other organizations, such as evaluation contractors in the experimental schools program, may be through more demanding contractual instruments.

Proposals for developing improved practices that schools might later adopt would come from the R&D community: Regional Laboratories, R&D Centers, School System Researchers, Universities, etc. Their prominent activity would be development, evaluation, and demonstration, supported by contracts awarded for unsolicited proposals. Evaluation of proposals would be accomplished by review panels of consultants.

4. Personnel Requirements

The requirements for personnel in proportion to program funds in the Bureau of Educational Systems is slightly higher than that of the Bureau of R&D Resources. This is primarily because contracts issued from this office involve development, which requires closer monitoring and more emphasis on implementation or dissemination than the research contracts located in the Bureau of R&D Resources. Figure 10 provides a scheme for estimating the number of people needed for program management that is similar to the one presented earlier, but reflects the higher costs associated with management of development.

For the specialty area programs, personnel should have both management skills and substantive expertise in the areas of contracting. That is, instructional product developers will be needed in the curricular program area, computer systems specialists should be available in the management area, etc. For many programs of this Bureau, staff should be professionals drawn from operating school agencies. Some of these staff members may be temporary people who come into NIE from the field for a year or so to manage specific projects and help keep the continuing staff current and the R&D projects relevant.

C. Bureau of Directed Programs

1. Programs

All of the suggested activities within the Bureau of Directed Programs are comprehensive problem-solving efforts. The current Career Education Program and the four suggested new programs, Home-Based Early Education, Learner-Controlled Education, Unbundling Higher Education, and Community Education Agencies, are included in the office. It is also recommended that some of the early childhood efforts from the National Program for Early Childhood Education and from five of the Regional Laboratories be considered for placement in the Home-Based Early Education Program and some activities from the Wisconsin and Pittsburgh R&D Centers and the Research for Better Schools Laboratory be placed within the Learner-Controlled Education Program. These efforts might provide some base for the new programs, be shaped to fit the program area, or, as they are completed, provide resources to do work of the new program area.

Table 6

Unsolicited Development Contract Management

Contract Size	Staff Required by Level and Number of Months				Personnel Costs of Management (including overhead)
	I	II	III	IV	
Below $100,000	0	1	2	1	$6,000
$101,000-300,000	1	2	2	1	12,250
$301,000-650,000	3	5	5	6	36,000
$651,000-1,000,000	6	9	9	9	62,250
Over 1,000,000	9	9	12	12	83,250

Examples of percent management costs by sample contract sizes are as follows:

$ 50,000	12%
150,000	8%
475,000	7%
800,000	7%
2,000,000	4%

2. Budget

This office has a total proposed budget of $45.5 million or about 38% of the 1973 program budget. A breakdown of that figure includes:

Career Education	$25,000,000
Home-Based Early Education	
Continuing Activities	4,000,000
New Design and Development	1,500,000
Learner Controlled Education	
Continuing Activities	5,000,000
New Design and Development	2,000,000
Unbundling Higher Education	
New Activities	2,500,000
Community Education Agencies	
New Activities	2,500,000

The allowable intramural budget in this area is $3.5 million. That figure is high, to provide for new program design and initiation of development within the Institute. Again, this figure is a top limit rather than a specific allocation, and, depending on the Bureau's needs, the money can be spent intramurally or extramurally.

3. Management Style

Programs in this Bureau are generally characterized by NIE initiative, planning, and direction. The Bureau will, for example, be responsible for the implementation of the research, development, and dissemination activities started by the Planning Unit. The general mode of program management within this division may be characterized by such words as positive, directed, and intrusive. Close monitoring, thorough management review, and familiarity with the contractor operation, management, and personnel will be more common than not. Program monitors will make frequent trips to contractor facilities. Specific performance criteria, definitive schedules, management plans, and the like will normally be expected of performing organizations.

4. Personnel Requirements

The requirements for personnel in proportion to program funds are higher for the Bureau of Directed Programs than for the other two Bureaus. This is because the work is either initiated internally, or is performed through solicited R&D contracts which require heavier monitoring than unsolicited efforts. A scheme for estimating management personnel needs, similar to those presented for the other Bureaus, is shown in Tables 7 and 8.

The participants and clientele served by this Office (lawyers, economists, management scientists, large R&D agencies, government planners, etc.) are likely to have a strong analytic and action orientation. The internal staff will serve on problem-oriented task forces that have the capability to carry out the research, development, and dissemination that is needed. The task force will consist of a team of senior and junior professionals who have been transferred from the Office of Problem Analysis and Program Planning, augmented by additional personnel.

The most effective size of task forces is unknown and probably should be subject to NIE experimentation during 1973. Initial experience in the Planning Unit has shown that effective size varies from task to task, and somewhat with the personalities involved in the task forces. For 1973 estimates, a reasonable average size to initiate programs might be two senior researchers, two associates (about a new Ph.D. level), two or three research assistants, three secretaries, and the equivalent of one year of senior researcher consultant time. To have a task force of this size for each of the four new programs would require forty-four staff members. In addition, the on-going Career Education Task Force could profit from having a staff of twenty-five now, and staff needs in other efforts will also grow as design and development progresses.

Table 7

Solicited Research Contract Management

Contract Size	Staff Required by Level and Number of Months				Personnel Costs of Management (including overhead)
	I	II	III	IV	
Below $100,000	0	2	2	2	$9,500
$101,000-300,000	1	3	3	3	18,000
$301,000-650,000	3	5	5	6	36,000
$651,000-1,000,000	5	8	8	12	60,750
Over 1,000,000	12	12	24	24	129,000

Examples of percent management cost by sample contract sizes are as follows:

$ 50,000	19%
150,000	8%
475,000	7%
775,000	7%
2,000,000	6%

Table 8

Solicited Development Contract Management

Contract Size	Staff Required by Level and Number of Months				Personnel Cost of Management (including overhead)
	I	II	III	IV	
Below $100,000	1	4	4	3	$21,750
$101,000-300,000	3	5	5	5	35,000
$301,000-650,000	5	8	10	7	62,000
$651,000-1,000,000	12	12	12	12	102,000
Over 1,000,000	18	12	18	18	138,000

Examples of percent management cost by sample contract sizes are as follows:

$ 50,000	43%
150,000	17%
475,000	13%
775,000	13%
2,000,000	6%

BIBLIOGRAPHY

Ahlstrom, W. A., and Havighurst, R. J. *Four Hundred Losers–Delinquent Boys in High School.* San Francisco: Lassey Bass, Inc., 1971.

Association for Childhood Education International. *Nutrition and Intellectual Growth in Children.* Washington, D. C.: Author, 1969.

Bailey, Stephen K. "New Dimensions in School Board Leadership." In *New Dimensions in School Board Leadership: A Seminar Report and Workbook.* Evanston, Illinois: National School Board Association, 1968.

Benson, C. S., Guthrie, J. W., and Ilchman, A. S. *Final Report of Research Priorities for Fundable Projects of the National Institute of Education.* A paper prepared for the NIE Planning Unit, 1971.

Blaug, M., (Ed.) *Economics of Education I.* Baltimore: Penguin Books, 1968.

Bowles, S. S., and Levin, H. M. "The Determinants of Scholastic Achievement: An Appraisal of Some Recent Findings." *Journal of Human Resources*, Vol. 3, No. 1, Winter 1968.

Burkhead, J. *Input and Output in Large-City High Schools.* Syracuse: Syracuse University Press, 1967.

Cahn, Edgar S., and Passett, Barry A. *Citizen Participation: Effecting Community Change.* New York: Praeger Publishers, 1971.

Caldwell, Bettye. *A Special Facility for Child Development and Education.* Washington, D. C.: Office of Child Development, Department of Health, Education, and Welfare.

Chapman, Judith E. *Early Childhood Research and Development Needs, Gaps, and Imbalances: Overview.* Washington, D. C.: Interagency Panel on Early Childhood Research and Development, 1972.

Chilman, Catherine. *Growing Up Poor.* Washington, D. C.: United States Government Printing Office, 1968.

Citizens for the 21st Century, Long Range Considerations for California Schools. Final Report of the State Committee on Public Education, 1968.

Citizen's Board of Inquiry into Hunger and Malnutrition in the United States. *Hunger, U. S. A.* Washington, D. C.: New Community Press, 1968.

Cloward, Richard A., and Jones, James A. "Social Class: Educational Attitudes and Participation." In *Education in Depressed Areas.* New York: Bureau of Publications, Teachers College, 1963.

Coffman, Alice and Dunlap, J. *The Effects of Assessment and Personalized Programming on Subsequent Intellectual Development of Prekindergarten and Kindergarten Children.* Washington, D. C.: United States Office of Education.

Coleman, James S., *et al. Equality of Educational Opportunity.* Washington, D. C.: United States Government Printing Office, 1966.

Coleman, J. S., and Karweit, N. L. *Multi-Level Information Systems in Education.* RAND Corporation Paper, P-4377, June 1970.

Commission on Instructional Technology. *To Improve Learning.* Washington, D. C.: United States Government Printing Office, 1970.

Coons, J. E., Clune, W. H., and Sugarman, S. D. *Private Wealth and Public Education.* Cambridge: Harvard University Press, 1970.

Cremin, Lawrence A. *The Genius of American Education.* New York: Vintage Books, 1965.

Department of Labor. *Career Thresholds.* No. 16, Vol. 1. Washington, D. C.: United States Government Printing Office, 1970.

Department of Labor. *Career Thresholds.* No. 16, Vols. 2, 3. Washington, D. C.: United States Government Printing Office, 1971.

Dyer, Marshall W. "The Teacher's Role in Using Special Events to Promote Public Relations." San Diego: San Diego State College.

Ellson, D., Harris, P., and Barber, L. "A Field Test of Programmed and Directed Tutoring." *Reading Research Quarterly.* Vol. 3, Spring 1968.

Fantini, Mario. *The Reform of Urban Schools.* Washington, D. C.: NEA Center for the Study of Instruction, 1970.

Faw, V. "A Psychotherapeutic Method of Teaching Psychology." *American Psychologist*, Vol. 4.

Filep, Robert. *Evolving Educational Goals in California Schools: Four Case Studies.* ERIC, Ed 050 136.

Fine, Jerry. "The Board's Role: Present and Future." In *New Dimensions in School Board Leadership: A Seminar Report and Workbook.* Evanston, Illinois: National School Board Association, 1968.

Flanagan, J. C., *et al. Five Years After High School.* Palo Alto: Project TALENT Office, American Institutes for Research and University of Pittsburgh, 1971.

Flanders, Ned A. "Personal-Social Anxiety as a Factor in Experimental Learning Situations." *Journal of Educational Research*, Vol. 45.

Flizak, Christopher W. "Organizational Structure of Schools and its Relationship to Teachers' Psychological, Sociological and Educational Role Orientation." Detroit: Wayne State University, 1967.

Folger, J. F., Astin, H. J., and Bayer, A. E. *Human Resources and Higher Education.* New York: Russell Sage Foundation, 1970.

Fusco, Gene C. *Improving Your School-Community Relations.* Englewood Cliffs, N. J.: Prentice-Hall, 1967.

Garms, Walter I. "An Approach to the Measurement of Educational Need." Unpublished paper prepared for the New York State Commission on Education, August 1971.

Ginsberg, E. "Toward a Theory of Occupational Choice: A Restatement." *Vocational Guidance Quarterly*, March 1972.

Gittell, Marilyn. *Participants and Participation.* New York: Center for Urban Education, 1965.

Glasser, W. *Schools Without Failure.* New York: Harper and Row, 1969.

Gordon, I. *A Home Learning Center Approach to Early Stimulation.* Washington, D. C.: National Institute of Mental Health.

Grant, V. *Man, Education, and Manpower.* Washington, D. C.: American Association of School Administrators, 1970.

Green, T. *Comprehensive Career Education Models: Problems and Prospects.* Policy Memorandum SYR 71-3. Syracuse: Educational Policy Research Center, July 15, 1971.

Guthrie, J. W., *et al. Schools and Inequality.* Washington, D. C.: The Urban Coalition, 1969.

Guthrie, J. W., *et al.* "A Study of School Effectiveness: A Methodological Middleground." Paper presented to the American Educational Research Association, March 1970.

Guthrie, J. W., and Wynne, Edward. (Eds.) *New Models for American Education.* Englewood Cliffs, N. J.: Prentice-Hall, 1971.

Hanushek, E. A. *The Education of Negroes and Whites.* Unpublished Ph.D. dissertation, MIT, 1968.

Hanushek, E. A., and Levin, A. "A Proposal for a School Information System." Unpublished RAND Corporation paper, October 1969.

Henrikson, H. A. "Role of Teacher Attitude in Educating the Disadvantaged Child." *Educational Leadership*, 28 (No. 4): 425-31, January 1971.

Hernstein, R. "I. Q." *Atlantic*, Vol. 228, September, 1971.

Hilton, T. L. *A Study of Intellectual Growth and Vocational Development.* Report for the Department of Health, Education, and Welfare (OE, NCERD), March 1971.

Jackson, P. W. *Life in Classrooms.* New York: Holt, Rinehart and Winston, 1968.

Jencks, C. (Ed.) *Education Vouchers, A Preliminary Report.* Cambridge, Mass.: Center for the Study of Public Policy, March 1970.

Jensen, A. R. "How Much Can We Boost I. Q. and Scholastic Achievement?" *Harvard Educational Review* Vol. 39, 1969.

Katzman, T. M. "Distribution and Production in a Big City Elementary School System." *Yale Economic Essays,* Vol. 8, No. 1, Spring 1968.

Kent, W. P., Bishop, R. L., Byrnes, M. L., Frankel, S. M., Herzog, J. K., and Griffith, W. S. *Job-Related Adult Basic Education,* Vol II. System Development Corporation, February 1971.

La Crosse, E. R., Litman, F., Ogilvie, D. M., and White, Burton. "The Pre-School Project: Experience and the Development of Human Competence in the First Six Years of Life." Cambridge, Massachusetts: Harvard University, Monograph No. 9, September 1969.

Lazar, Joyce B., and Chapman, Judith E. *Early Childhood Research and Development, Needs and Gaps in Federally Funded Intervention Studies Within a Longitudinal Framework.* Washington, D. C.: The George Washington University, 1972.

Levine, Daniel V. "Crisis in the Administration of Inner City Schools." *School and Society*, Vol. 94, 1966.

Liddle, Gordon P. "Existing and Projected Research on Reading in Relationship to Juvenile Delinquency." In *Role of the School in Prevention of Juvenile Delinquency*. Washington, D. C.: United States Government Printing Office, 1963.

Liddle, Gordon, P., and Rockwell, Robert E. "The Role of Parents and Family Life." *Journal of Negro Education*, Vol. 34.

Lopate, Carol, *et al. Some Effects of Parent and Community Participation on Public Education.* New York: Teachers College, Columbia University, 1969.

Martin, W. E., and Stendler, C. B. *Child Behavior and Development.* New York: Harcourt, Brace and Company, 1966.

Mather, Louis K. *The New American School of Adults.* Washington, D. C.: National Education Association, 1965.

Mays, John B. *The School in its Social Setting.* London: Longmans, Green and Company, Ltd., 1967.

McCarty, Donald J., and Ramsey, Charles E. *The School Managers.* Westport, Conn.: Greenwood Publishing Company, 1971.

McKinsey & Company. *Allocating Educational Funds to the Community School Districts.* Board of Education, City of New York, November 1970.

Mentec Corporation. *Evaluation of the Relevance and Quality of Preparation for Employment under the MDTA Institutional Training Program.* Final Report, USOE, Contract No. OEC 0-70-5043 (335).

Moffitt, Frederick J. "Public Relations Remains a Naughty Word to Schoolmen." *Nation's Schools*, October 1967.

Moraus, A. E., and Lourie, R. "Hypothesis Regarding the Effects of Child-Rearing Patterns on the Disadvantaged Child." In *The Disadvantaged Child*, Vol. 1 (Ed. by J. Hellmuth). New York: Branner/Mazel, 1967.

Morrison, H. I. *Employer-Based Career Education Model: Six Critical Components.* Final Report, Automated Systems Corporation, ASC-4198, USOE Contract No. OEG-0-71-3196, June 30, 1971.

Mort, Paul R., and Vincent, William S. *A Look at Our Schools: A Book for the Thinking Citizen.* Lancaster, Pa.: Cattell and Company, 1946.

Mosteller, F., and Moynihan, D. P. (Eds.) *On Equality of Educational Opportunity.* New York: Random House, 1972.

National Center for Educational Statistics. *Adult Basic Education Program Statistics, Students and Staff Data,* July 1, 1969 - June 30, 1970. Washington, D. D.: United States Government Printing Office, 1971.

National Center for Educational Statistics. *Digest of Educational Statistics, 1970 Edition.* Washington, D. C.: United States Government Printing Office, March 1971.

National Center for Educational Statistics. *Statistics of Public Schools, Fall 1970.* Washington, D. C.: United States Government Printing Office.

National Education Association. *Rankings of the States, 1972.* Washington, D. C.: National Education Association, Research Division, 1972.

National Education Finance Project. A series of volumes financed under the Elementary and Secondary Education Act of 1965 and published in 1970.

New York State Commission on the Quality, Cost and Financing of Elementary and Secondary Education (Fleischman Commission). A series of volumes released in 1972.

Niedermeyer, F. C. *Parent-Assisted Learning*. Inglewood, California: Southwest Regional Laboratory, TR 19, 1970.

Plant, W. *Effects of Preschool Stimulation Upon Subsequent Performance Among the Culturally Deprived.* Washington, D. C.: United States Office of Education.

Popham, W. J. "Performance Tests of Teaching Proficiency." *American Education Research Journal,* Vol. 8, No. 1, January 1971.

President's Commission on School Finance. *Schools, People, and Money–The Need for Educational Reform.* Final Report, 1972.

Ravitz, Mel. "Urban Education: Today and Tomorrow." In *Urban Education in the 1970's.* New York: Teachers College Press, 1971.

Rheingold, H. L. "The Modification of Social Responsiveness in Institutional Babies." Monograph, *Society for Research on Child Development,* Vol. 21, No. 2, 1956.

Rioux, J. W. "The Disadvantaged Child in School." In *The Disadvantaged Child,* Vol. I (Ed. by J. Hellmuth). New York: Branner/Mazel, 1967.

Rogers, David R. *110 Livingston Street.* New York: Random House, 1968.

Rosenthal, R., and Jacobson, Lenore F. "Teacher Expectations for the Disadvantaged." In *Science, Conflict and Society.* San Francisco: W. H. Freeman and Company, 1969.

Schiff, Herbert J. "The Effects of Personal Contactual Relationships on Parent's Attitudes Toward Participation in Local School Affairs." Evanston, Illinois: Northwestern University, 1963.

Select Committee on Equal Educational Opportunity, U. S. Senate. "The Financial Aspects of Equality of Educational Opportunity" and "Inequities in School Finance." Washington, D. C.: United States Government Printing Office, 1972.

Seusholes, Bradbury. "Political Socialization of Negroes: Image Development of Self and Policy." In *Negro Self-Concept: Implications for School and Citizenship.* New York: McGraw-Hill, 1965.

Shapiro, Max. *Parental Concerns in a Rapidly Changing School System.* New York: Division of Community Relations, New York City Schools, 1968.

Shockley, W. "Negro I. Q. Deficit: Failure of a 'Malicious Allocation' Model Warrants New Research Proposals." *Review of Educational Research,* Vol. 41, No. 3, June 1971.

Smoker, D. S. *Vocational Education: Innovations Revolutionize Career Training.* Washington, D. C.: National School Public Relations Association, 1971.

Springle, H. *A Sequential Approach to Early Childhood and Elementary Education.* Washington, D. C.: Office of Economic Opportunity.